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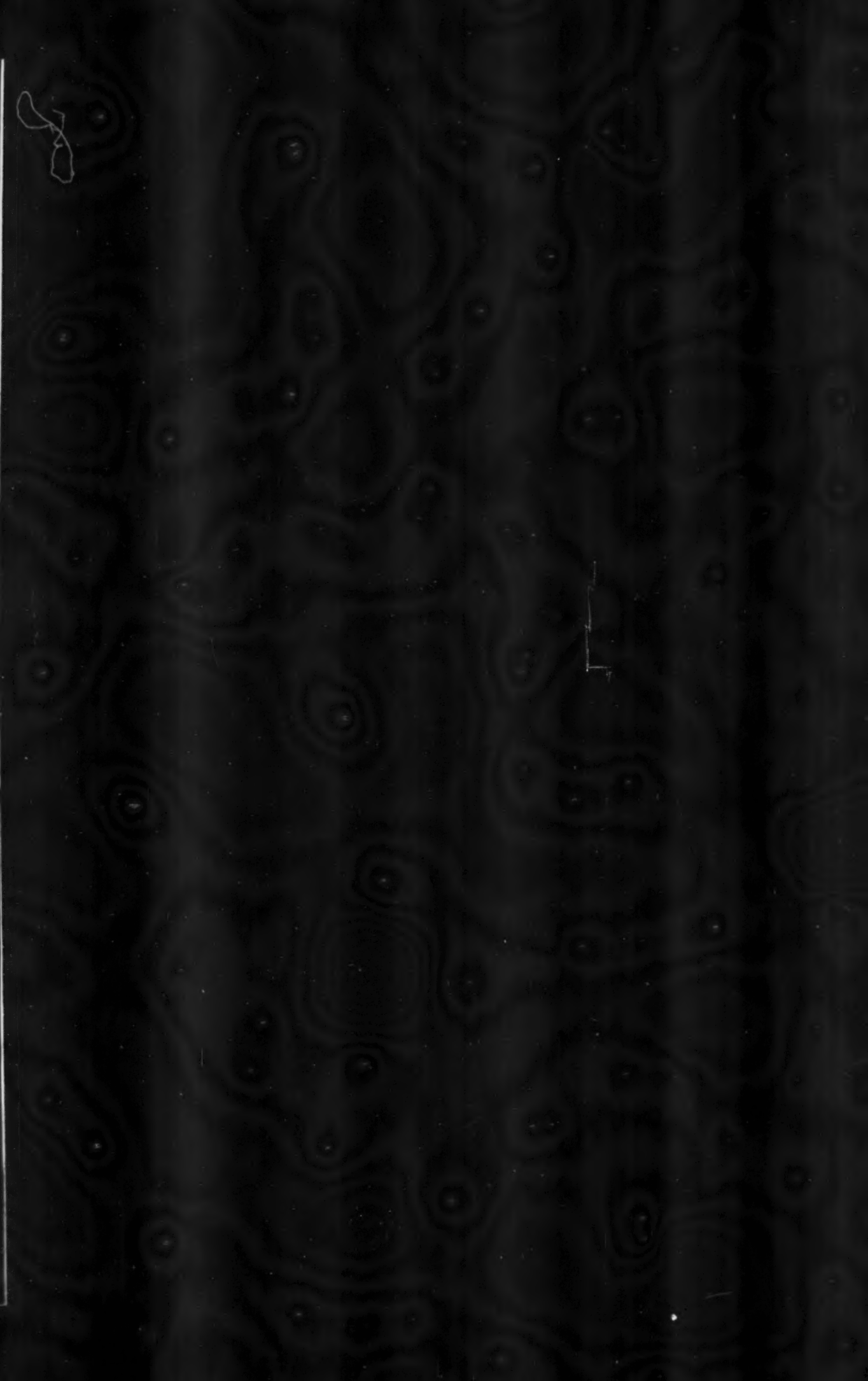

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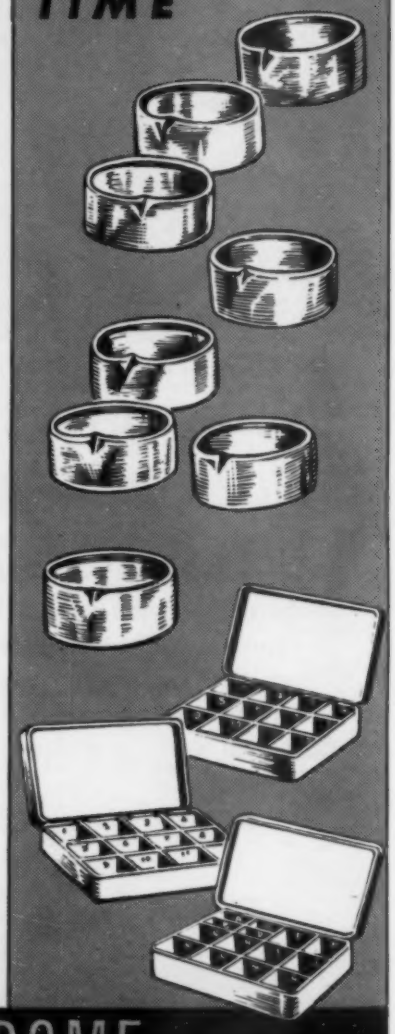

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George R. Moore, Secretary, American Association of Orthodontists
1949-1950

American Journal
of
ORTHODONTICS

VOL. 36 MARCH, 1950 No. 3

Original Articles

PRESIDENT'S ADDRESS

GREAT LAKES SOCIETY OF ORTHODONTISTS

WILSON R. FLINT, M.S., D.D.S., PITTSBURGH, PA.

FOR the past year it has been both an honor and a privilege to serve you as President of the Great Lakes Society of Orthodontists. It is an added pleasure to welcome you to Pittsburgh.

When you accepted the invitation last year in Cleveland to hold the twentieth annual meeting here, I searched the records of the American Association of Orthodontists, our parent society, and found that the last orthodontic meeting held in Pittsburgh was in July of 1916. For thirty-three years, we who live here have been royally entertained at meetings in other cities, and it affords us real pleasure to have this opportunity to attempt to repay in kind our genial hosts of other years.

Looking back, it is interesting to note that there were but 70 to 75 members in attendance at the 1916 meeting held in this hotel. There are three members attending this meeting today who were present in 1916. One is our esteemed and much-honored Past President, Dr. Oliver W. White, who, at that meeting, gave a paper on "Habits—Restoration of Functional Activity and Growth of Soft Tissues Involved in Orthodontic Treatment." Ollie White has contributed much to the advancement of orthodontics and we are justly proud to have him with us.

I was interested in finding Dr. Joseph Johnson, President-Elect of the American Association of Orthodontists, scheduled to give a clinic. I do not know how many years before that meeting Joe was dispensing orthodontic knowledge, but I do know in the thirty-three years since that time he certainly has been most generous. We are both fortunate and happy that he is a member of our society. Joe is going to give us a paper this afternoon.

Presented at the meeting of the Great Lakes Society of Orthodontists, Pittsburgh, Pa., Nov. 14 and 15, 1949.

The third man, who was elected to the Board of Censors of the American Society of Orthodontists in 1916, was Dr. Ralph Waldron. I was most anxious to have him on our program for two reasons: (1) he is an able orthodontist and teacher and has an enviable record of fine presentations; (2) I wanted to prove to him that certain derogatory remarks which he made with respect to dirt and our fair city are no longer true, thanks to the progress of our smoke control program.

I read with interest President Kemple's address and other parts of the 1916 meeting's program. This record of the American Association of Orthodontists provided an excellent basis for comparing both the times and orthodontics as a profession in 1916 with present conditions in the world about us now and our relations, as orthodontists, with this new era. A constant evolutionary, if not revolutionary, change is taking place all about us. The growth of the American Society of Orthodontists from 125 in 1916 to over 950 today shows a constant and steady growth of our profession. Our own society, which is but one of seven components of the American Association of Orthodontists, has an excess of 140 members. In a world of almost explosive change, we have made solid progress.

Over the past three decades there has been a gradual change in the context of the Presidents' addresses. In earlier days, the subjects were mostly confined to views of the scientific side of our profession. About 1916 there was a great controversy on the relative merits of base and noble metals in appliance construction. Today the emphasis has been away from the scientific side and now centers on improving the operation of our organization with special attention to the relationship of our profession of dentistry to this changing world about us.

Changes in national affairs, our profession, and even in our own lives come slowly and often so quietly that we are not aware of what is happening. By focusing our attention on significant landmarks in the past, the direction and scope of change are made evident.

With the growth of our nation and its evolution from an agrarian economy to an industrial economy with larger concentrations of population in cities, a change has developed in the fundamental thinking of the masses of our population. As a result of pressures by political and social forces, we find a drift toward socialism. From infancy, this has been a vigorous nation—made strong by millions of people who have made every possible effort to gain the rewards of self-reliant living.

It is apparent on all sides that our inner strength has started to ebb. A sickness threatens to drain the character of the American people. It has been stated that this is our real health problem. We are letting a sorry wish for care-by-government deaden the urge for self-care.

The other day a former patient, just ready to leave for college, dropped in for his usual check-up. His late father had been a prominent physician and I naturally thought he would be following in his father's footsteps. I asked him what he was going to make of himself. I was quite shocked when he answered that he refused to go into medicine because of the impending socialization of that field. That attitude appears to be typical of present-day thinking.

Dr. Kenneth A. Easlick, of the University of Michigan, has written an excellent article entitled, "The Publics' and the Profession's Stake in the Future of Dentistry." In this article, he traces the development of dentistry, its acceptance as a health measure, and the government's growing interest in dentistry as a health measure.

Dr. Easlick states that health planning by the federal government started in 1908 when Theodore Roosevelt invited over two hundred people to attend the first White House Conference on health care. No dentists were invited to this conference which met and discussed for two days in January, 1909, the care of dependent children. Dentistry had not yet reached a status to warrant any participation in national health planning.

As a result of this conference a bill was introduced into the Senate establishing a Federal Children's Bureau. It has been in operation ever since. In 1919 President Wilson called another White House Conference under the auspices of the Children's Bureau to set up standards of child welfare. At present all states have bureaus of maternal and child health to work for the securing of more and better health care for mothers and their children.

The first conference in which dentists participated was a conference on child health and protection called in November, 1930, by President Hoover. In 1933 the Emergency Relief Administration made relief funds available for emergency dental care. According to Easlick, on Aug. 14, 1935, President Roosevelt signed a congressional act which is a milestone in the development of dentistry. The Federal Social Security Act provided sums through federal grants to expand health services and to train public health personnel. He stated, "It provided a definite line of demarcation between two eras in the development of dentistry as a profession. It divides the present era, in which dentistry is meeting the accumulated forces of social change, from a preceding era during which dentistry struggled hard to justify itself to the public as a health profession at all.

"With the status of a health profession has come a new public responsibility for dentistry and one on which this Social Security Act continues to focus attention. For nearly a century, dentists had thought about dentistry merely for dentists; since 1935 we have had to think of dentistry for the public."

From 1935 to 1938 great strides were made in the expansion of public health dental activities with aid to the states from the Social Security funds. You will recall in February, 1939, only ten years ago, Senator Wagner first introduced a National Health Bill. The Wagner-Murray-Dingell Bill was introduced first in June, 1943, and is of such recent memory that it will only be mentioned in passing that while dental care was not included at first, there was to be a two-year study before recommendations were to be made. Since 1943 an ever-increasing interest has been taken in health legislation at the federal level. Numerous bills, all within recent memory, including a new Wagner-Murray-Dingell National Health Bill, have been introduced in Congress with the chief purpose of aiding the public in their quest for more social security.

Because orthodontics is an important part of the dental health picture, and because its importance is growing in the public mind, we should know where our specialty is going to fit into the sequence of things. In June, 1947, a group of leaders of our specialty were invited to discuss essential orthodontic health service for children at a conference held at the Children's Bureau in Washington. Our government has become interested in extending financial aid in programs for physically handicapped children, and will cooperate with proper state authorities and professional groups in extending orthodontic care for the underprivileged children of the nation. Most of you know that such a program has been carried on in New York state for the past five years.

What is to be our position in relation to these social and political changes? It is not at all likely that the trend, which is so evident and which appears to be gathering momentum, will be reversed. The advice given to us, as dentists, is to acquaint ourselves thoroughly with the public health program. Then, after we are sure of our facts, unceasingly to try to educate our patients and friends so that they understand dentistry's and medicine's attitude with respect to government control and administration. Then we should exert all the influence we are able to bring to bear on our elected representatives in Congress. These things we can do with effect. Our efforts can and must direct this trend of the times in a sound and sensible direction to the end that public welfare, as well as our profession, will benefit.

During the past year it has been my pleasure to serve you in the capacity of one of the directors of the American Association of Orthodontists. It has given me an insight into the workings of the parent body of which I previously had no knowledge. The changing times and the increased size of the American Association of Orthodontists contribute to making the operation of the parent body quite a task. The opinion has been expressed many times that, from an educational standpoint, smaller group meetings are more desirable. It is my conviction that the profession as a whole would be better served by limiting the larger meetings of the American Association of Orthodontists to every other year and having two meetings of the component societies on the alternate years—one in the spring and one in the fall. Such a scheduling would add to the convenience of the membership by saving time and reducing travel. From an educational standpoint, the members would benefit by having smaller group meetings.

Dr. Lowrie Porter has proposed that the director's term be extended to at least two years and that the alternate be chosen with the assumption that he will succeed to the directorship. He also proposed that the alternate director should sit in on all directors' meetings in order to become thoroughly acquainted with the workings of the board. A one-year term merely acquaints the director with the workings of the parent society. Two years with his alternate in attendance will give the component societies better representation. I would recommend that our Constitution and Bylaws Committee draft such a change in our bylaws to conform with the ideas expressed.

Throughout the past history of our organization there has been considerable discussion with respect to requirements for membership. As a result the Great Lakes Society has the highest qualifications of any of the components of the American Association of Orthodontists. That there should be any discrepancies among entrance requirements of the components has seemed questionable to some of our members.

Lowrie Porter's persistent effort during his administration to remove some of the discrepancies with respect to requirements for admission to the components of the American Association of Orthodontists has brought forth fruit in the form of a proposed change in the Constitution and Bylaws of the American Association of Orthodontists. These qualifications for membership are the result of compromise and agreements among the representatives of all components. It was the feeling of some representatives that entrance to the American Association of Orthodontists through the components should be uniform.

However, we all contend that we would like to see the standards of our profession improve. Unless the bylaws of individual components are so drawn that higher standards are fostered in one than in another, such improvement is made impossible not only in the component, but also by gradual infiltration, in the parent body itself. The Association is not likely to raise its standards except as the result of gradual rise taking place in the components one by one as they copy each other. One has only to look at progress in the general level of education and other divisions of our culture to see that segregated areas took the lead, others followed, and finally all areas were obliged to seek a higher level.

Notwithstanding the facts mentioned, there has been a temptation to relax our Great Lakes membership standards to meet demands imposed by the great numbers of veterans and others desiring university training in orthodontics but unable to obtain admission to our overcrowded institutions. Had this demand continued we might have found it feasible to relax our admission requirements to the level now proposed by the American Association of Orthodontists. However, on the contrary, the demand for training has been diminishing steadily since a few months after hostilities ceased, and there is every indication that it will continue to do so.

As president I wish to recommend intensive study of the whole problem of membership requirements by our Committee on Constitution and Bylaws for the purpose of drafting changes, if indicated for the improvement of health service.

A proposed amendment to the American Association Bylaws in regard to associate membership in the constituent societies reads as follows: "The minimum standards of eligibility for associate membership in the Constituent Societies shall be:

"1. One year of university graduate or post-graduate orthodontic training with recommendation by the head of an orthodontic department; or

"2. One full calendar year of preceptorship with an active member, recommendation to be by preceptor; or

"3. In exceptional cases a combination of the above two may include orthodontic training from informal courses. The combination must satisfy the entire committee which passes on applications. The applicant must be recommended by two active members of the Constituent Society to which he applies; or

"4. Two years full time specialization including orthodontic training from informal courses, preceptorships, or seminars. These sources of training must satisfy the entire committee which passes on applications, recommendation to be by two active members of the Constituent Society to which the applicant applies."

Here again I recommend that our Constitution and Bylaws Committee draft changes, if indicated, for the purpose of meeting American Association of Orthodontists' minimum requirements.

A proposed amendment to the American Association of Orthodontists' bylaws in regard to the elevation of associate members in the constituent societies to active membership in both constituent society and American Association of Orthodontists reads as follows:

"A person who has been an associate member in a Constituent Society of the American Association of Orthodontists for one year and who is a member in good standing in his local, state and national dental organizations, may be elected to active membership through the Constituent Society, provided the applicant has:

"1. Three years of specialization, including one full time year of university graduate or post graduate orthodontic training with recommendation by two active members; or

"2. Three years of specialization, including two years preceptorship or an equivalent which must satisfy the entire committee which passes on applications, with recommendation by two active members; or

"3. Four years of specialization, including informal training by preceptors, suitable short courses or seminars which satisfy the entire committee which passes on applications, with recommendation by two other active members."

Again I wish to recommend that our Constitution and Bylaws Committee draft changes, if indicated, to meet American Association of Orthodontists' requirements.

Experience also has shown the need for some changes in the handling of this organization's fiscal affairs. Incoming officers are left very much in the dark as to what funds are available for educational programs, entertainment, and general organizational expenses. There should be some guide to help incoming officers in performing their duties. I wish to recommend that a Budget Committee be set up. This can be an appointive or elected body, whichever seems advisable to the Constitution and Bylaws Committee. The duties of such a committee should be to meet during the time of our fall session to review our our financial structure and set up a workable budget for the next year's activities.

Before I close, I would like to pay tribute to the excellent cooperation we have had from the members of the Pittsburgh Orthodontic Society. Here in Pittsburgh, we are sort of a heterogeneous group. Six of us belong to the Great Lakes Society while the others owe their allegiance to the Northeastern or the Southern Societies. This diversity stems from the geographical position of our city which is located on the boundary lines of these three groups. Some of our members like the bright lights of New York City, some prefer southern hospitality, while the rest of us must have heeded the famous admonition of Horace Greeley, "Go West, Young Man." I want to express my heartfelt thanks to my friends here in Pittsburgh for their wholehearted support.

I also wish to congratulate our society upon having such a fine and efficient secretary as Scott Holmes. The successful operation of this type of organization is due in large measure to the effectiveness of its secretary. Scott is really deserving of your praise and thanks.

I regret very much that the dates for our meeting conflicted with the Ohio State Dental Meeting in Columbus. Dr. Walter Sargeant, President of the Ohio State Dental Society, Dr. Earl Jones, Treasurer, Henry Cossitt, Program Chairman, and many others of our membership are absent due to this conflict. We received regrets from Dr. G. Vernon Fisk, of Toronto, who has been honored with the Presidency of the Canadian Dental Association. In that capacity, he is on a Western tour at this time. We are sorry that he cannot be with us, although we do wish him the best of luck in his honored position.

Speaking for the members of the Pittsburgh Orthodontic Society, as well as for myself, I trust your visit here will be both pleasant and profitable. If all the wonderful plans in the way of buildings, parks, and roadways that are in the air for our city materialize, you will hardly recognize us when you come here for your next meeting. We only hope you will not make it so long between visits.

SPACE CLOSURE IN EXTRACTION CASES

PAUL D. LEWIS, D.M.D.,* SEATTLE, WASH.

ONE of the most interesting, and sometimes perplexing, problems in our specialty is the study of the face and its relationship not only to the bones of the face but also to the apical base which supports the teeth. So much has been written for and against the removal of teeth for the correction of malocclusions that it would be only repetitious to enumerate it again.

The trend today in orthodontics appears strongly to be in favor of the removal of selected teeth in the correction of certain cases. In certain types of malocclusions, after a careful study of the patient, photographs, x-rays, and casts, it becomes apparent from case analysis that dental units must be removed if stable dentures are finally to be obtained after orthodontic treatment. The apical base, or bony structure, which holds and supports the roots of the teeth of our patients is far too often inadequate.

The illuminating work that has been done in cephalometrics further substantiates the necessity or advisability of a compromise procedure in many of our cases. The idea of always expanding the dental arch in a vain effort to stimulate basal bone growth has proved a keen disappointment in most of our hands. Blocked-out teeth refuse to stay in line during retention; rotations are difficult or impossible to hold. One has only to cut the teeth off the model in such cases and reset them on their own bases to find out that successful results cannot be achieved by retaining all of the teeth all of the time.

In the types of cases under consideration, treatment attempted without the reduction of tooth units only serves to exaggerate facial disproportion. Because of the lack of bony support, teeth cannot be moved to self-sustaining positions in their arches. These are fundamental premises in the minds of most orthodontists at present.

In proposing the following treatment technique to be used in tooth reduction cases, I am fully aware of its limitations. Realizing also that it may be changed and improved upon, and that it will need to be varied for individual cases, it is offered as an efficient, simple, and practical treatment procedure. When used with reasonable care and intelligence it will close spaces quickly, efficiently, and with as little apparent harm to the tissues involved as any other technique of which we know.

THE FIRST STAGE OF TREATMENT

The Maxillary Arch.—After a careful survey of the case has been made, let us assume that it has been decided to remove maxillary and mandibular first premolars. A week after the extraction, when the soreness and swelling have

Read before the Pacific Coast Society of Orthodontists, San Francisco, Calif., Feb. 22, 1949.

*Clinical Associate Professor of Orthodontics, University of Washington, School of Dentistry.

disappeared, an alginate impression is taken for the construction of a maxillary removable appliance. The objectives of this appliance are: (1) to move the maxillary cuspids distally; (2) to hold the maxillary posterior teeth securely together, preventing their tipping or drifting forward; (3) to open the bite when it is deemed necessary to do so; (4) to take the posterior teeth out of occlusion when the lower buccal teeth are to be placed in their proper axial inclination; (5) to keep the bite open while the lower cuspids are being moved distally into their new positions.

The use of the maxillary removable appliance during the initial stages of treatment permits the free distal movement of the maxillary cuspids unhampered by the conventional arch wires. High cuspids and mesially inclined cuspids are moved with remarkable rapidity and with seemingly little or no discomfort to the patient.

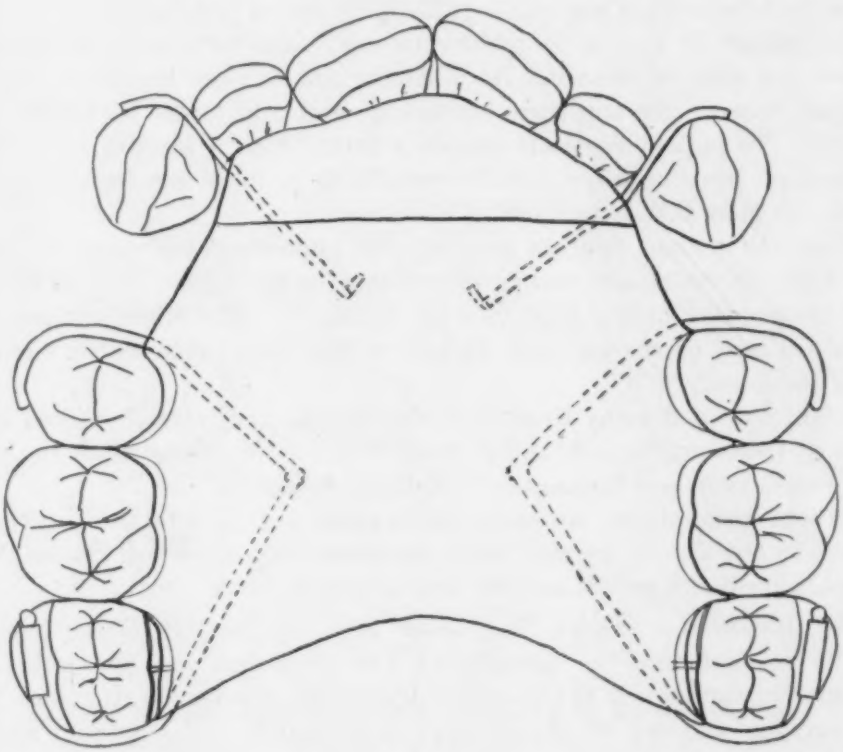

Fig. 1.

When it is desirable to remove second premolars instead of first premolars, it is also possible to move the first premolars back with the removable appliance to be followed later by the cuspids.

In the construction of the maxillary removable appliance, 0.026 inch round wire clasps are bent to fit around the distal and buccal surfaces of the molars and the mesial and buccal surfaces of the second premolars. This holds the buccal teeth quite securely together. Smaller wires are bent anteriorly to the cuspids and rest on their mesial surfaces. (Fig. 1.)

Molars and premolars may or may not be banded at the operator's discretion. If they are banded, the wire clasps around the molars may be bent to rest on the buccal tubes, thus helping to hold the appliance in place.

The maxillary removable appliance is placed in the patient's mouth and the wires are bent and adjusted to fit the buccal teeth and to hold the appliance firmly in place. The palatal material, both lingually and distally to the cuspids, is ground away so that both of these teeth are free from the acrylic. The wires mesial to the cuspids are bent just to touch their mesiobuccal surfaces. If the patient has a deep overbite a flat bite plane is used, and this is ground and adjusted so that all six lower incisors are in occlusion with it. The posterior teeth are thus taken out of occlusion.

Occasionally there will be the case in which it is not desirable to open the bite. In such an instance the bite plane or block is not built into the appliance. The acrylic material is cut away from the lingual surface of the maxillary incisors so that the lips can exert a backward pressure on these teeth.

The patient is instructed in how to insert and to remove the appliance, and how and when to clean it. He is taught how to clean his mouth and teeth, instructed to wear the appliance constantly, and told to eat with it in during all meals. The patient generally reports a little difficulty in chewing during the first meal or two but after that he reports he is more comfortable with the appliance in place than with it out.

When the patient returns for the next appointment a slight adjustment to the wires on the molars and premolars may be necessary. This is sometimes due to the settling of the appliance in the mouth. The wires anterior to the cuspids are bent or sprung back slightly so that they press on the mesial surfaces of these teeth.

It will be noted many times that the cuspids have already moved distally a little of their own accord, and it takes but a little urging from the springs on their mesial surfaces to maintain this distal movement.

At each appointment attention is directed not only to the movement of the cuspids, but also to the care which the patient gives the soft tissues that the removable appliance covers and the teeth adjacent to it.

The Mandibular Arch.—The lower first and second molar bands are generally made before the mandibular first premolars are removed. If the mesioaxial inclination of the mandibular cuspids is severe, half-round lingual tubes may be soldered on the six-year molar bands and a lingual appliance placed.* Spurs mesial to the second premolars from the lingual prevent these teeth from drifting or tipping forward. The cuspids will generally drift distally quite rapidly, and, in doing so, axial relationship will improve correspondingly. (Fig. 2.)

Usually, however, the lingual appliance is not used as the cuspids more often than not present a normal or nearly normal axial inclination.

Edgewise bracket bands with their necessary auxiliary attachments are made for the cuspids and second premolars. Rotating springs or levers are soldered on the bands that are to be cemented on all rotated teeth. This

*Tweed Seminar, 1946.

auxiliary attachment is strongly advocated. These efficient auxiliaries are inconspicuous and require no more time in soldering than the placing of a staple. Besides assisting in its rotation, the spring lever holds the tooth in its corrected position as long as the bands remain cemented because of its constant contact with the arch wire. The fact that the spring lever is in constant contact with the arch wire many times permits the use of a simple ligature tie around the bracket instead of the more complicated rotational tie.

A tooth that has been rotated into its correct position and held there during the months of treatment is more likely to remain permanently and not seek its old position during or after retention.

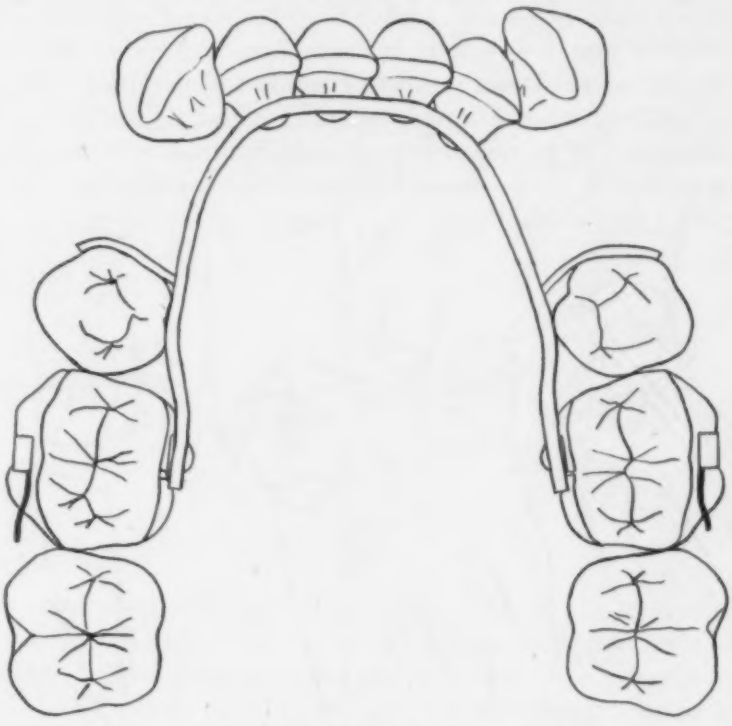

Fig. 2.

It is desirable and possible in this technique to have both maxillary and mandibular cuspids travel back along the arch wire, through the cancellous bone, in a vertical position. A staple soldered incisally to the arch wire on the mesial surface and gingivally on the distal surface is also of some assistance in preventing tipping.

The six-year molars are banded, and whenever possible the twelve-year molars are also banded. If the twelve-year molars are banded they carry a section of 0.022 inch by 0.028 inch tubing; however, if the twelve-year molars cannot be banded at this time, the tubing is soldered on the six-year molar bands. The molar, second premolar, and cuspid bands are cemented, and an 0.016 inch round stainless steel arch wire is placed. This beginning arch wire

is bent to approximate the malocclusion with no thought toward ideal arch form and no attempt toward expansion. Bands are not placed on the four lower incisors at this time.

It has been stated many times that no two malocclusions are exactly alike. There are some common characteristics, however, in regard to tooth position in the cases under consideration in this paper.

Among these may be listed varying degrees of overbite from the open-bite to the very deep variety with the latter being the most often seen. The deep overbite is invariably associated with an exaggerated curve of Spee which results in a peculiar stair-step arrangement of the mandibular teeth.

It is interesting to note the number of casts which exhibit mandibular cuspids standing from 1 to 4 mm. higher than the mesial of the six-year molars. In some instances the lower four incisors are as high or higher than the cuspids; however, more often the lower cuspids and the distal marginal ridges of the second molars, when erupted, are the highest points in the mandibular plane of occlusion. It is not thoroughly understood whether these cuspids are in supra-occlusion, if the premolars are in infra-occlusion, or whether it is a combination of the two factors.

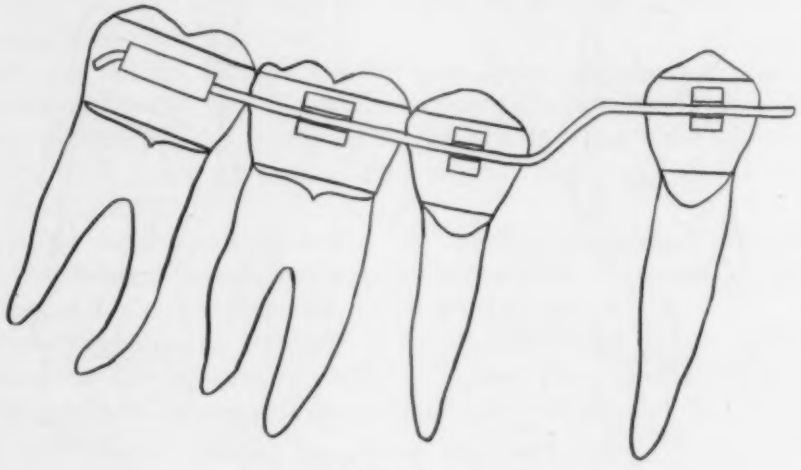

Fig. 3.

It is readily seen also that the deeper the overbite and the greater the curve of Spee, the greater the possibility that each mandibular buccal tooth will be located on a different height or level. (Fig. 3.) This fact seems to bear enough significance to warrant further discussion for a few moments.

After the removal of the lower first premolars, the starting small round arch wire should be bent generally to fit the malocclusion, not only to avoid needless strain and soreness to the mandibular buccal teeth but also to avoid any unwanted distal tipping of the cuspids. If the occlusal curve is at all great and the cuspids are on a much higher plane than that of the second premolars, definite step-up bends should be placed mesial to the second premolars so that the arch wire enters the cuspid backets from a horizontal direction.

It is easy to see how an adverse distal tipping to the lower cuspids may readily be started when these bends are neglected. This simple step takes but a few moments. If soreness and tipping can be prevented by placing them there, it is well worth the operator's time to put them in.

At a later appointment the step-up bends in the lower arch wire are reduced or removed entirely, depending on the degree of the original bends. (Fig. 4.)

Definite step-down bends distal to the cuspids are next placed into the arch wire. Thus, from the very start the cuspids are gradually depressed and at the same time the second premolars and molars are elevated. Cuspids, and later the central and lateral incisors as well, are depressed during treatment.

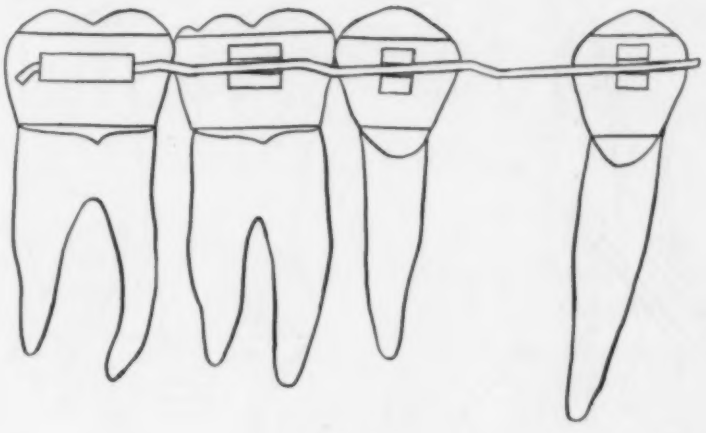

Fig. 4.

There is some discussion as to how much teeth can be depressed. Are we depressing these high cuspids in the lower arch or is it a matter of elevation of infra-occluded premolars and molars that occurs when the mandibular arch is leveled off? It is well known that elongation of teeth is more easily accomplished than the depression of teeth. It appears clinically possible, however, to depress teeth to some extent.

If a rotated tooth that has been corrected early in treatment is easier to hold during retention, then it certainly should follow that early adjustment in vertical height, be it in the maxilla, the mandible, or both, will also be more permanent during and after retention.

From a mechanical standpoint there is less likelihood of the cuspids tipping when they are being moved distally on a plane that is not higher than their anchorage—the posterior teeth. High mandibular cuspids can and do hit points of interference in the maxillary arch when being moved distally unless depressed first. (Fig. 5.)

This leads to the inevitable conclusion that maxillary and mandibular cuspids and incisors, but particularly the cuspids, should be depressed and

maintained there during treatment so that during and after retention they will not pound each other in the lateral excursions of the jaws, which often leads to the collapse of the incisors.

Granted there will be some elongation of the cuspids during and after retention. Is it not better, if possible, to prevent interference by these teeth in lateral excursions of the mandible at least for the first few months of retention, or until reorganization of bone has taken place? (Fig. 6.)

Maxillary and mandibular cuspid bands must be placed far enough incisally so that when an ideal arch is placed toward the end of treatment these teeth are not elongated but may be slightly depressed in relation to the occlusal plane.

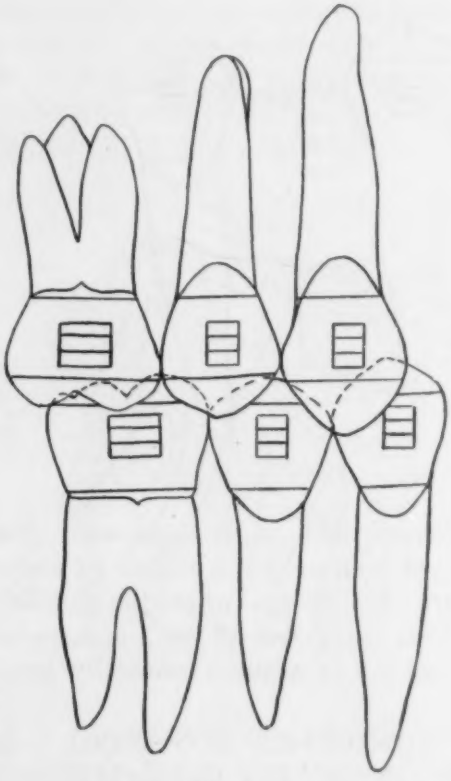

Fig. 5.

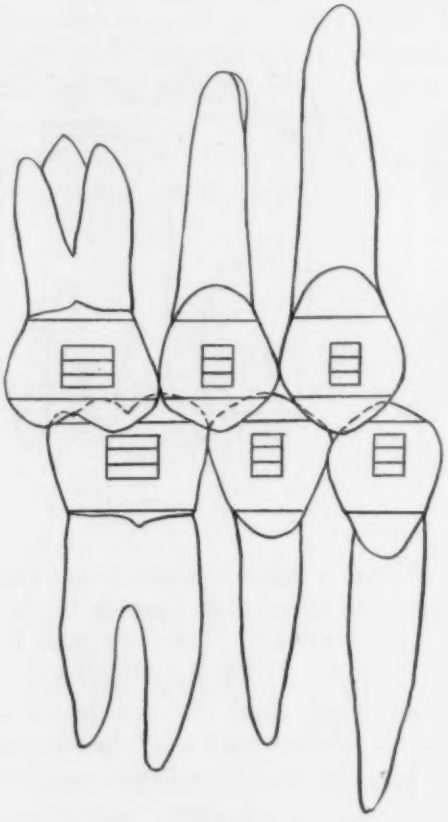

Fig. 6.

Slight tip-back bends are generally placed in the molar region of this 0.016 inch starting arch wire. The last one-eighth of an inch is annealed and, after ligating, these annealed ends are bent down. This locks the arch wire back, preventing it from crawling forward.

Generally, at the following appointment, an 0.018 round arch wire is placed. Again, it is fashioned to fit the malocclusion, so that expansion will not occur except to gain bracket engagement and to obtain a general leveling off of the buccal teeth. In fact, there should be a narrowing effect in the

canine area, because these teeth in traveling distally should be kept in the cancellous bone between the buccal and lingual plates. This is an important point since the canines travel distally faster when the dense cortical bone is not a point of interference. (Fig. 7.)

The use of these small round arch wires is ideal, both as to time and effect in the correction of rotated teeth. The correction of malrotated buccal teeth should be started and completed as early as possible during the first stages of treatment.

The 0.018 inch wire is generally followed by an 0.020 steel arch wire bent to fit the malocclusion with little or no expansion force. The correction of rotations is continued together with a leveling off of the buccal teeth.

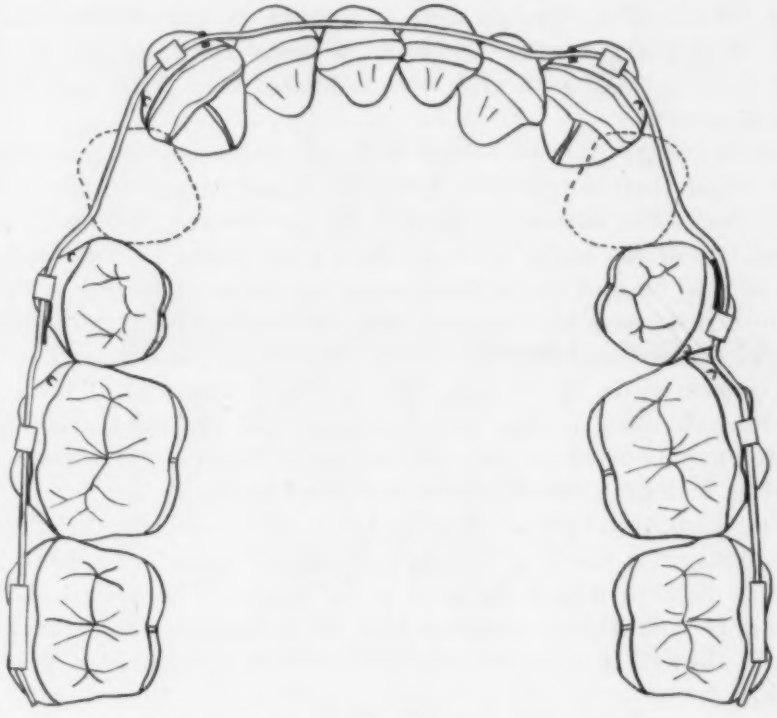

Fig. 7.

A rectangular 0.021 inch by 0.025 inch gold or stainless steel arch wire is made next and distinct step-in bends are placed between the mesial of the second premolar's and the canines. This step-in bend is quite negligible at the distal of the canine but rather marked at the mesial of the second premolar. By the use of these step-in bends, the canines are prevented from being forced buccally as they travel distally into the space of the extracted first premolars.

Bracket engagement is, or should be, completed and rotations of the buccal teeth, if any, should have been completed or nearly so at this time. When the mandibular buccal teeth present a mesioaxial inclination due to the

result of the mesial drift, occipital anchorage should be employed. Tie-back stops are soldered 1 mm. distal to a mark immediately in front of the buccal tubes. Stops or intermaxillary hooks are soldered 2 mm. mesial to the canine brackets for use of headgear hooks. To avoid soreness, this 0.021 inch by 0.025 inch arch wire is ligated into place for an appointment or two until it can be seated comfortably into the brackets. (Fig. 8.)

When bracket engagement is secured, slight tip-back bends are placed in the molar and premolar areas of the arch wire and a headgear is worn at night. The hooks of the headgear fasten around the arch wire just mesial to the spurs in front of the canines or to intermaxillary hooks. The pull of the headgear activates the tip-back bends, resulting in the gradual uprighting of the premolar and molar teeth. The headgear can be continued until the buccal teeth are in a vertical or slightly distal axial inclination.

When the mandibular buccal teeth do not present a mesioaxial inclination as described, it is not generally necessary to wear the headgear at this time. The 0.021 inch by 0.025 inch arch wire is ligated into place until bracket engagement is secured.

A section of tightly wound 0.008 inch coil spring is measured and cut one-half inch longer than the distance from the mesial surface of the right canine bracket to the mesial surface of the left canine bracket. The arch wire is removed and one of the molar tie-back stops is unsoldered. The section of coil spring is slipped on and the tie-back soldered again. The arch wire is placed in the mouth just above the brackets, and the distance from the mesial surface of the right canine bracket to the mesial surface of the left canine bracket is carefully measured on the spring. The spring is then cut at the points just marked, thus dividing it into three sections: the central section, which fits between the canine brackets, and the two small distal sections measuring one-quarter of an inch each, which will be described later.

At first it will be safe to stretch evenly, or to activate the coil spring so that it extends from distal of canine to distal of canine. Tip-back bends are checked and the arch wire is replaced in the mouth. The central section of the coil spring is compressed between the lower canines, and the two distal sections are allowed to remain on the arch wire in the extracted first premolar areas. (Fig. 9.)

It is necessary to point out here that the distal staples of the cuspid bands should be securely ligated to the arch wire as long as the coil spring is active. This prevents these teeth from rotating lingually as they move toward the second premolars.

In the distal movement of the canines (into the extracted first premolar areas), it is well constantly to bear in mind the importance of securing and maintaining the best anchorage possible in the premolar and molar areas throughout treatment of the patient.

The arch wire is allowed to remain for two appointments; then it is removed and the tip-back bends in the molar regions are increased slightly. The coil spring is further activated until it stretches from mesial surface of second premolar to mesial surface of second premolar.

Antitip spurs soldered mesially to the brackets, just gingival to the arch wire, act as excellent brakes in keeping both upper and lower cuspids vertical as they are being moved by the coil spring. They are soldered on very easily and are in constant contact with the arch wire as the coil spring moves these teeth distally. (Fig. 10.)

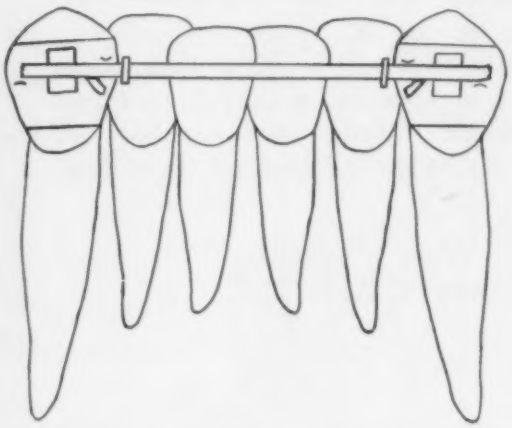

Fig. 8.

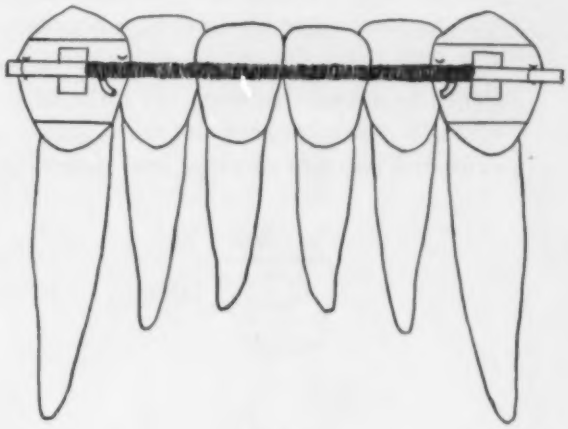

Fig. 9.

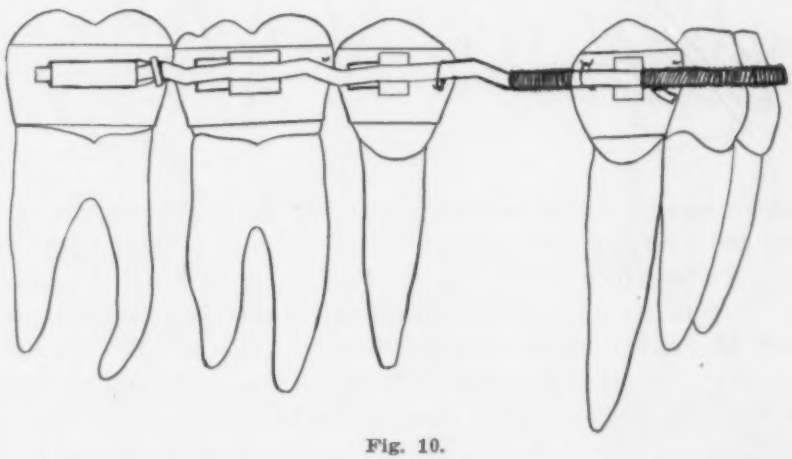

Fig. 10.

As the canines begin to approach the second premolars, it may be necessary to increase the coil spring force. At this time, one or both of the two distal sections of the coil spring that were allowed to remain in the areas distal to the canines are now slipped to the areas mesial to the canine brackets, without the necessity of removing the arch wire, thus providing the additional force needed at this time. These small sections are not activated themselves but merely function as stops against the canine brackets, increasing the longer spring pressure. (Fig. 11.)

About this time it will be noted that the maxillary cuspids have moved distally quite a distance, due to the action of the finger springs on the re-

movable appliance. If the four incisors were bunched or protruding, some of the lingual acrylic is ground away. The pressure of the lips many times will carry them back to a more favorable position.

The operator should note if there is any tendency of the lower canines to tip distally. If so, a slight tip-forward bend is placed in the canine area of the arch wire to upright these teeth and maintain them in a vertical position as they move along the arch wire.

Shortly after this lower appliance is placed it will be noted that spaces begin to appear between the unbanded lower incisors, and as the canines travel distally these spaces increase quite markedly. Many times bunched and crowded incisors unravel and rotations wholly or partially correct themselves.

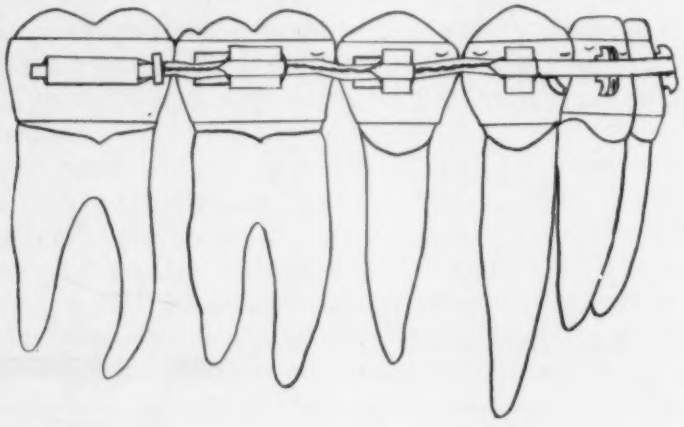

Fig. 11.

In some cases it will be necessary to move the lower canines distally the entire distance with the coil spring until they are in contact with the second premolars. Falling into this category will be found Class I malocclusions, in which there exists an extreme crowding of the incisors, or in which the canines are in marked mesioaxial inclination. This condition indcates that there was very possibly a forward drift of the premolars and molars. It also indicates that the canines should occupy the full space of the first premolar before banding the four incisors. This plan of treatment applies particularly to double protrusion cases as well.

Restating this principle, when the malocclusion is such that the full space gained by the removal of two lower premolars must be utilized to correct the crowded condition of the four incisors and to place them over basal bone, the canines should be carried back fully to the second premolars. When this has been accomplished it is well to ligate the molars, second premolars, and cuspids tightly together as one unit with a single ligature to prevent the canines from moving forward, thus opening the contacts between themselves and the second premolars.

Needless to say, the best possible anchorage, including second molars when available, should be maintained throughout treatment. When reducing

spaces after extraction, all contacts should be closed as perfectly as tooth pattern and tooth size will permit. At this time the coil spring is removed and the four lower incisors are banded. (Fig. 12.)

An 0.016 inch steel arch wire is placed and correction of rotations and closure of spaces in the incisors are started. This is followed, if necessary, by 0.018 inch and 0.020 inch round arch wires. After bracket alignment is secured the incisors are brought into the same relative occlusal plane as the posterior teeth.

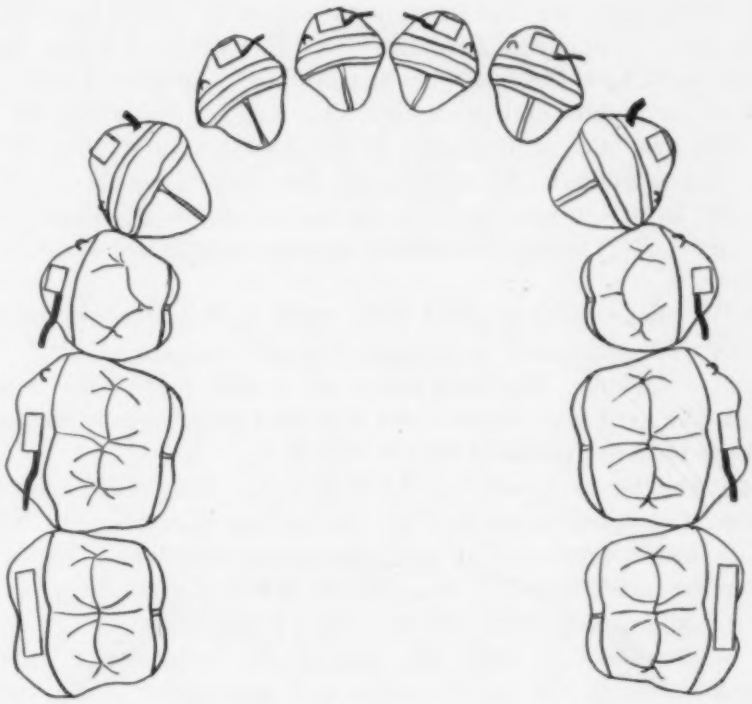

Fig. 12.

Spaces remaining in the newly banded lower incisors are reduced by a space-closing appliance made of 0.020 inch round steel arch wire. It is constructed so that the closed loops lie either between the cuspids and lateral incisors or the cuspids and second premolars. When the loops are activated by ligating from the molar tie stops, the four incisors are quickly brought together and the spaces closed. (Fig. 13.)

The next step is to construct an 0.021 inch by 0.025 inch arch wire and prepare for the use of extraoral anchorage. As second order bends are incorporated into this appliance, they are activated by the headgear, thereby preparing the lower arch for anchorage.

During the time that the lower cuspids are being carried back by the coil spring, the maxillary removable appliance is active also in moving the upper cuspids distally. The overbite is reduced and vertical adjustment in the posterior teeth is being encouraged. Each time the spring is adjusted to the

upper cuspids, the condition of the soft tissues of the palate as well as the lingual and buccal surfaces of all the upper teeth is carefuly checked.

Strict home and office prophylaxis is required of the patient so that no damage is done to these tissues. A 2 per cent solution of NaF is applied to all teeth before bands are cemented, and this may be repeated at intervals to the upper teeth during the time the removable appliance is worn. If the overbite needs to be reduced still further, as is necessary in extreme close-bite cases, this can be quickly done by adding some quick-setting repair material to the bite ridge.

When the mandibular four incisors have been banded it is time to dispense with the maxillary removable appliance. By this time the upper cuspids have been carried back to a closer approximation with the second premolars.

If the upper molars and premolars were not banded when the removable appliance was first placed, it should be done at this time. Cuspid bands are also made and cemented. In some cases the cuspids rotate slightly as they move distally, in which case rotating spring levers are soldered on the bands for this correction. The four maxillary incisors remain unbanded for the time being.

An 0.016 inch starting steel arch wire is made to approximate the malocclusion. No expansion is attempted except to gain bracket engagement and to start rotations. Tip-back bends of a mild degree are placed in the molar areas, the arch wire ligated, the annealed ends bent up to secure it into place, and the patient dismissed for two weeks.

Slightly heavier arch wires of 0.018 inch and later 0.020 inch are successively worn if deemed necessary for the patient's comfort in bringing the buccal teeth into alignment and completing the rotations. When the initial soreness has worn off from the use of these starting appliances, an 0.021 inch by 0.025 inch gold or steel edgewise arch wire is made.

If it is necessary to move the cuspids farther distally, intermaxillary hooks are soldered in the lateral areas and sections of tightly wound 0.008 inch coil spring are slipped on either side of the arch wire, extending from the hooks to the cuspid brackets. Molar tie-back stops are soldered and slight tip-back bends are placed in the molar areas. The arch wire is ligated into place and the activated coil springs are compressed between the hooks and the cuspid brackets. (Fig. 14.)

If the mandibular arch is not ready for the use of intermaxillary elastics, a headgear is used on the maxillary arch wire to offset the forward pull of the coil springs. Tip-back or second order bends of a mild degree are placed in the molar areas.

Very often occipital anchorage can be used to a great advantage in the reduction of spaces in the maxillary arch. As auxiliary anchorage it has several advantages to commend its serious consideration. Aside from its usefulness in helping to carry the canines distally, if worn faithfully it maintains most effectively the mesiodistal relationship of the buccal teeth. Slight tip-back or second order bends are placed in the molar region of the arch wire and increased moderately as the patient becomes accustomed to wearing the headgear at night.

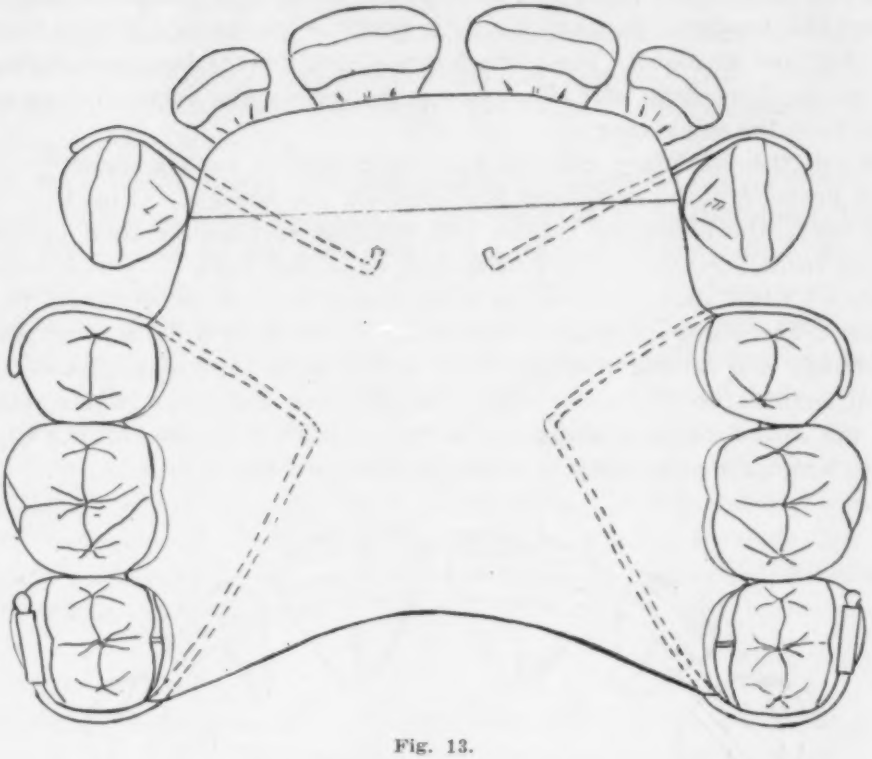

Fig. 13.

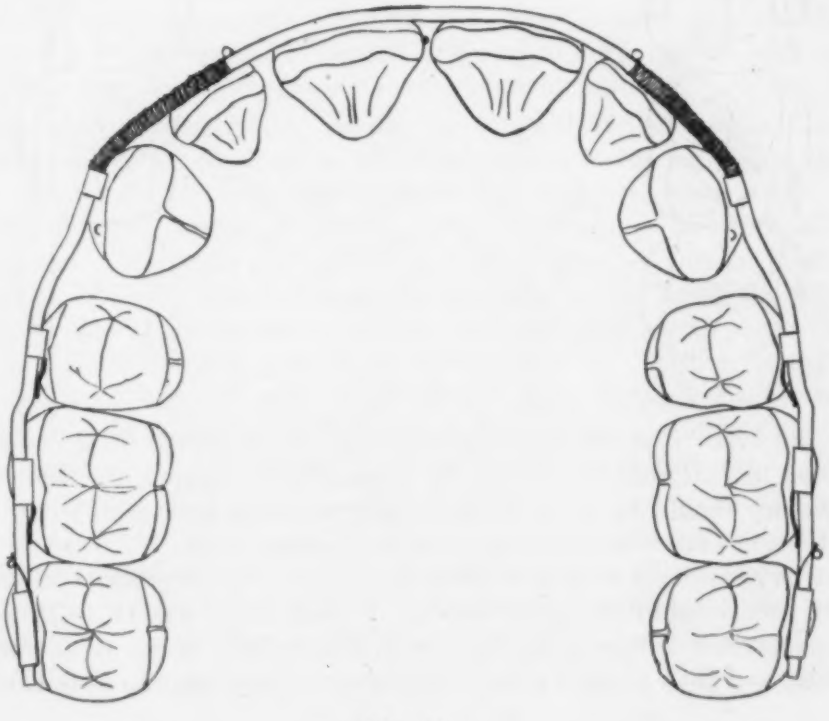

Fig. 14.

When these sections of coil spring are placed, the patient is instructed to wear this headgear as many hours as possible for the first day or two, and after that just at night. The extra hours of pull by the headgear during the first two or three days will offset to a great degree any forward drag on the molars from the coil spring.

When the maxillary cuspids have been moved back sufficiently to the second premolars, the maxillary four incisors are banded. (Fig. 15.) These bands carry the necessary staples and rotating springs for their correction. If these teeth are protruding and should be tipped back, a space-closing appliance of 0.020 inch round steel with closed loops is constructed for this purpose. The loops are placed just distal to the lateral incisors or between the cuspids and second premolars. It is the same type of appliance as described before for the lower arch. In addition, the loops, when activated from the molar tie-back stops, act as intermaxillary hooks for the Class II elastics which are a necessity in this step of the procedure.

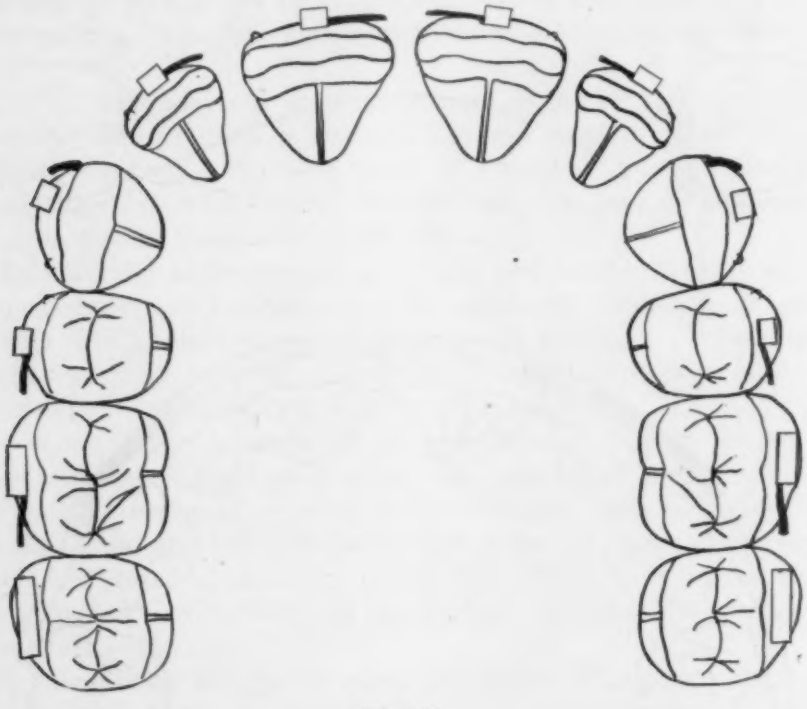

Fig. 15.

In the event that the four incisors need to be carried back more bodily or require lingual root torque for the closing of the spaces, the same type of an appliance should be made of 0.021 inch by 0.025 inch arch wire. Again, Class II elastics are worn from the loops to the lower arch.

Let us consider a case that presents a Class I facial pattern with a Class II tooth relationship or malocclusion. Should the Class II tooth relationship be corrected before extracting, or is it generally better to extract, close all spaces, and then place the teeth into their normal cuspal relationship?

The latter procedure is generally favored as the primary step, i.e., the closure of spaces after the removal of the premolars. Then, secondly, the reduction of the Class II condition is accomplished. If this latter plan is followed, the maxillary and mandibular four incisors will be banded for the minimum length of time.

To repeat, the spaces are first closed or almost closed, depending on the operator's plan of treatment, and then the Class II relationship is treated. Thus it will be seen by this plan that both upper and lower incisors are saved from much punishment due to the shortened length of time they carry bands.

When the four maxillary incisors are banded, an 0.016 arch wire is made and worn for an appointment or two to bring the anterior teeth into bracket alignment. Here again it is prudent to ligate the canines securely to the premolars and molars to prevent any opening of their contacts. The next step is to place a round or an 0.021 inch by 0.025 inch closed loop arch wire, or any other space-closing appliance, to close the spaces between the canines and the incisors. If at this time the mandibular arch is ready for intermaxillary anchorage, hooks are soldered on the arch wire and elastics are worn to assist in this adjustment.

BORDERLINE CASES

There are malocclusions in which the entire distal movement of the canines will not be advisable. In these instances the mandibular canines are moved distally only far enough so that the four incisors may be banded and maintained over basal bone in a plus 5° to a minus 5° position. These are the borderline cases in which only approximately one-half a premolar space is necessary. For the best esthetic end results, the remaining spaces in the extraction area are then closed by moving the second premolars and molars forward.

The technique involved in the moving forward of the mandibular second premolars and molars to close the remaining spaces in the extraction area will now be considered: An 0.021 inch by 0.025 inch arch wire is made with tightly closed loops.* The loops are made just distal to the cuspids on either side. The posterior legs of the loops are bent 0.5 to 1 mm. higher or more occlusally than the anterior section. This depresses the six incisors and keeps the premolars and molars from being depressed. Slight tip-back bends are placed in the first and second molar areas and the loops are activated by ligating from the premolar brackets to ligature spurs soldered just distal to the loops. A rotating spring or fulcrum soldered on the distal surface of the second premolar bands prevents these teeth from rotating lingually as they move forward. (Fig. 16.)

One or several adjustments may be necessary to move the second premolars into close contact with the cuspids. The forward movement of these two teeth is always accomplished with the use of Class II intermaxillary elastics. These elastics are worn from intermaxillary hooks soldered to the arch wire, mesial to the molar tubes, to the customary hooks on the maxillary arch wire. The molars

*Tweed Seminar, 1948.

are moved forward by means of similar closed loops on an 0.021 inch by 0.025 inch arch wire, and Class II elastics are also a necessity in this step of the treatment as well.

When the spaces between the buccal teeth have been closed by moving the posterior teeth forward, a stabilizing arch wire of 0.0215 inch by 0.028 inch is placed on the lower arch and it is prepared for so-called stationary anchorage by the use of the headgear.

After case analysis it may be found advisable or necessary to remove second premolars in both the maxillary and mandibular arches instead of first premolars. Tooth size or shape, extensive caries, and large fillings are some of the factors that may influence one's decision. Also, congenitally missing second premolars in one or both arches are, as we know, quite common. A brief description of appliance technique follows.

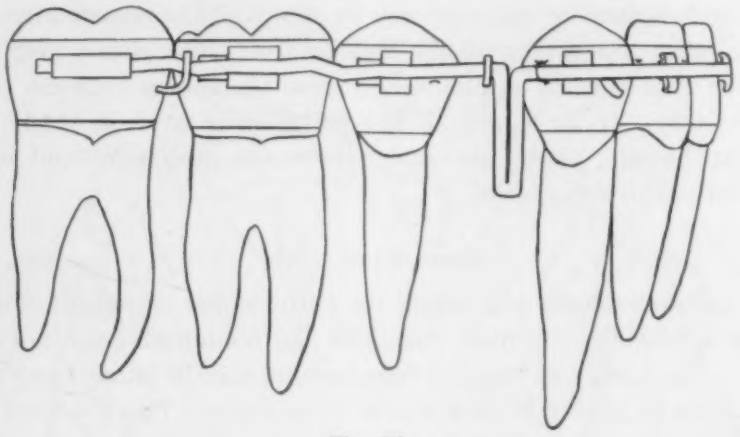

Fig. 16.

The maxillary removable is made so that, in addition to the cuspid springs, two additional springs are added to move the first premolars distally. When these teeth have been moved distally sufficiently, as indicated by the setup, part of the springs are cut off and the wire is bent to form a clasp around the mesial surface of the premolars. The cuspids are moved back by their springs as described previously. (Fig. 17.)

In second premolar extraction cases the lower presents a different problem of closure than when first premolars are removed. The broader roots of the first premolars offer more resistance to their distal movement than do the cuspids. This problem is met by first moving the premolars and then later the cuspids to the positions indicated by the setup.

After leveling off has been accomplished with the small round arch wire as has been described, an 0.021 inch by 0.025 inch wire is made and placed on the lower arch with headgear hooks soldered on the arch wire between the central and lateral incisors. Sections of tightly wound 0.009 inch coil spring are placed between these hooks and cuspid brackets. These are followed by two more sections of coil spring between the cuspid and first premolar brakets. This means four sections of coil spring, two on each side, in tandem, in addition to the headgear.

The premolar coil springs are activated, and when reinforced by the headgear at night, these teeth are moved distally. It is not advisable to activate the cuspid coil springs while the premolars are being moved distally. At this time these sections merely act as a stop to prevent the cuspids from being moved mesially.

When the first premolars have reached their approximate positions, the distal coil springs are removed and the premolars are ligated to the molars. This obvious precaution is necessary to keep them from moving mesially again.

Fig. 17.

The coil springs between the intermaxillary hooks and the cuspid brackets are now activated and the headgear is continued at night to assist in the movement of these teeth. If the first premolars have been moved all the way back to the molars, there may be enough anchorage in these posterior teeth so that a continuous coil spring, from cuspid bracket to cuspid bracket, can be used, thus eliminating the necessity for the headgear. However, if the first premolars are moved only part way back, it is wise to continue with the headgear because of the lack of sufficient anchorage.

After completing the distal movement of the premolars and cuspids the four incisors are banded and the case is continued according to the plan of treatment.

In either the maxillary or the mandibular arches where spaces are closed after extractions, it is obviously wise to make certain that these spaces do not open in the extraction area after once being closed. The cuspids should be ligated back to the premolars and molars in the maxillary as in the mandibular arch. Once back, the cuspids should be held there tightly as long as the bands are on. At this point a gold or steel edgewise arch is made and placed on the maxillary teeth and the case is finished in the usual manner.

When it is decided in the operator's judgment that the treatment is completed, the bands may be removed and acrylic retainers made. It is not only expedient but very effective to run wires distally to the upper molars and distally to the lower six-year molars so that, in addition to the wire on the anterior teeth, there is an effective check from behind to hold the teeth in contact.

In extraction cases, due to the piling up of soft tissues between the canines and second premolars, there is an apparent tissue tension which necessitates extra precaution during retention. All contacts should be closed as completely as possible, especially between these two teeth, before impressions are taken for retainers.

SUMMARY

The use of the removable appliance on the maxillary arch facilitates the movement of the cuspids without the necessity for banding any or all of the maxillary teeth. It makes possible, also, the movement of partially erupted, or high, cuspids, into their approximately correct positions when they are not erupted far enough to band.

The coil spring technique on the mandibular arch has an advantage in that the full arch wire is used during the entire treatment. This obviously allows more control of buccolingual position during movement of the cuspids.

The arch wires are so formed that they guide the cuspids between the buccal and lingual plates into their new positions through the action of the coil spring. As they slide along the arch wire the cuspids reach their approximately correct positions vertically or nearly so.

If overexpansion of the teeth is avoided through the careful formation of the arch wires, the maxillary and mandibular arches during retention should have a relatively similar pattern or outline as the original malocclusion.

The extrusion and intrusion stress or movement caused by the use of the vertical spring loop is eliminated. Second premolars and molars need not be depressed as the cuspids are moved distally.

Adjustments to keep the cuspids moving are made mesially to these teeth. The power or pressure developed from the coil spring is delivered equally on both cuspids and in a horizontal direction. Thus it will be seen that the posterior or anchor teeth are disturbed the minimum amount.

All cuspids that are in so-called supra-occlusion should be depressed early in treatment. They should be kept from elongating as long as bands and appliances are on, so that during and after retention the cuspids will not strike each other excessively hard in lateral excursion, thereby encouraging early collapse.

Extraoral anchorage is used on the lower arch to prepare it to withstand the pull of Class II elastics. It is also used, if necessary, to maintain or reinforce this anchorage during the time elastics are being worn for the distal movement of the maxillary teeth.

By the same token, if and when Class III elastics are to be worn, the headgear is first applied to the maxillary arch, preparing it in like manner for the elastic pressure, and is worn continuously on the upper as long as the Class III rubbers are used.

It is not claimed that this technique will bring about better results than other methods. However, the pressure on the moving teeth is constant; tooth movement is accomplished with the minimum of irritation and damage to the tissues and, lastly, with little or no pain or discomfort to the patient.

APPLICATION OF THE PHOTOELASTIC METHOD OF STRESS ANALYSIS TO ORTHODONTIC TOOTH MOVEMENT IN BONE

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ORTHODONTIC diagnosis and treatment must include a consideration of the stresses set up by the application of external forces to the teeth. There has been no method, to date, for measuring these stresses which occur during orthodontic tooth movement. The purpose of the present study has been to devise a photographic technique for demonstrating such stresses.

In 1816 Brewster found that when a piece of glass is strained it becomes doubly refractive.[1] This phenomenon, known as the "photoelastic effect," is true, to a varying degree, of almost all transparent materials. When a strained doubly refractive transparent substance is analyzed by means of a light-polarizing optical machine known as a polariscope, varicolored striations and patches are observed in the strained material. As the actual stress differs from point to point in the material, so do the induced areas of double refraction. A colored pattern is thus created, characteristic of the light source employed and related to the kind and magnitude of stress, and the nature, size, and shape of the material under study.

The applied technique of photoelasticity is a method of measuring the change in optical properties brought about by the application of external forces to such materials as glass, Bakelite, and cellulose. This change is "translated into terms of stress and . . . interpreted by means of the fundamental ideas of the theory of elasticity and strength of materials."[1]

The photoelastic method of stress analysis, which has found its greatest use in engineering and related fields, may be summarized briefly as follows:

1. A model, simulating a prototype (bone in the experiment), is constructed of a suitable transparent material.
2. Forces are applied to the model similar to those affecting the real life prototype, and the optical changes in the material as seen through crossed light-polarizing disks are recorded and translated into a measure of the state of internal stress of the model material.
3. By applying the stress effects observed in the model material to the analogous system of the prototype, we can know more accurately what happens when the original material is strained.

METHODS

All applications of polarized light necessarily involve two actions: (1) a polarizing system is required to polarize the light; (2) an analyzing system acts to identify the polarization.

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Fig. 1 is a photograph of the polariscope used in this experiment. The illuminating source employed was a white-light incandescent projection lamp. The stress patterns thus show the colors of the spectrum, rather than a single color as in the case of a monochromatic light source.

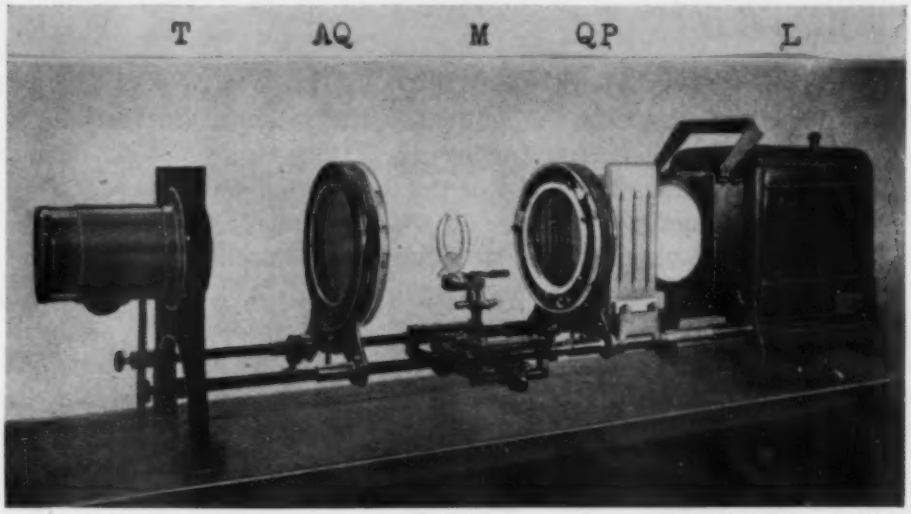

Fig. 1.—Photograph of the polariscope used in this experiment. *T*, Viewing screen; *A*, analyzer; *Q*, quarter-wave plate; *M*, model; *P*, polarizer; *L*, light source.

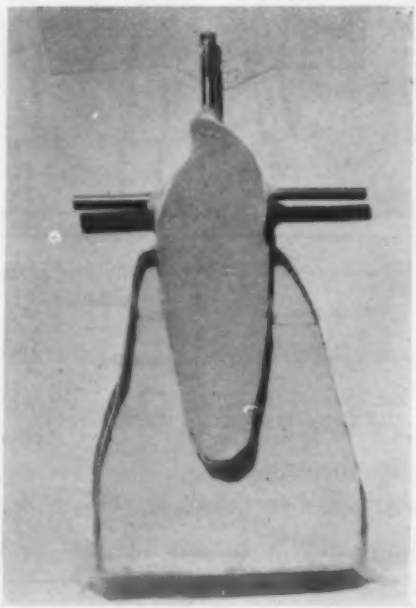

Fig. 2.—Tooth model in bone socket.

The white light from the incandescent lamp is converted into plane-polarized light by the initial Polaroid disk, or polarizer. The first quarter-wave plate then changes the plane-polarized light into circularly polarized light which

passes through the model. The second quarter-wave plate reconverts the circularly polarized light to plane-polarized light before it, in turn, enters the analyzer and then the camera lens. Both polarizer and analyzer are so mounted as to be capable of independent rotation. The two quarter-wave plates are in fixed positions so that their polarizing axes are at 45° to the corresponding axes of the Polaroid disks.

Construction of the Model.—A templet was made of a photomicrograph appearing in an article by A. M. Schwartz,[2] illustrating a cross-section of the premolar of a young dog. After tracing the pattern on a piece of transparent Bakelite material, a simulated model of the bone socket was formed. This was done with a fine scroll saw, slowly and with continuous water lubrication to avoid overheating the plastic, which would destroy its optical properties.

The sawed-out part of the operation was readapted to the plastic bone socket using softened baseplate wax. A mold was formed, and by means of the usual denture-flasking process an opaque acrylic counterpart of a tooth was constructed. Three metal rod extensions were embedded in the crown part of the model tooth to facilitate the application of the various orthodontic forces.

Fig. 2 illustrates the model tooth inserted into the transparent Bakelite model of the bone socket.

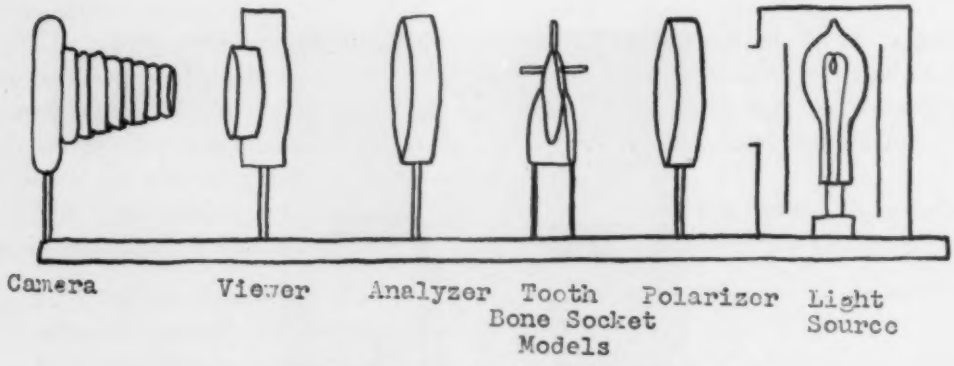

Fig. 3.—Illustration of complete experimental set-up.

EXPERIMENTAL PROCEDURE

The forces applied in the experiment are recorded according to Angle's classification of the movements of teeth[3]:

Order 1. Labial, lingual, and buccal tooth movements; tooth rotations, depressions, and elongations.

Order 2. Mesial and distal tipping of the teeth.

Order 3. Root and crown shiftings that are accomplished by use of torque force.

Fig. 3 shows the experimental set-up, diagrammatically. Fig. 4 illustrates the method of applying forces to the model.

RESULTS AND DISCUSSION OF RESULTS

Table I illustrates the method of recording the photographic results obtained in the experiment.

TABLE I

ORDER OF FORCE	DIRECTION OF FORCE	DESCRIPTION OF FORCE	FIGURE NUMBER
A.O. 1*	Labial	3.5 u.f.†	6
A.O. 3	Labial	3.0 u.f.	7
A.O. 3	Lingual	3.5 u.f.	8

*A.O., Angle order.
†u.f., units of force per division of elastic gauge—one ounce.

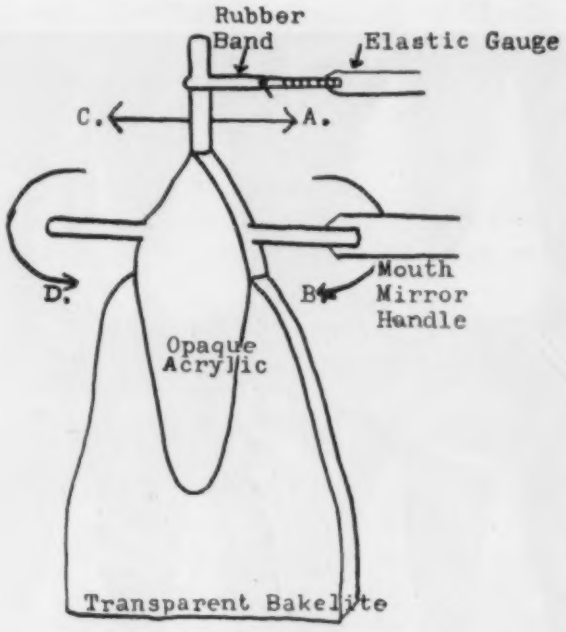

Fig. 4.—Diagram illustrating method and types of force application. *A*, Labial tipping; *B*, labial torque; *C*, lingual tipping; *D*, lingual torque.

The black and white photographs show that:

1. The number of black lines observed on the white background of the model bone socket is proportional to the force applied to the plastic tooth model.

2. Severe torquing forces cause the greatest number and widest distribution of stress lines. This conforms to clinical practice in that the torquing force necessary to move tooth roots is much greater than the force required for labial or lingual tipping movements.

It must be emphasized that the photographs presented in this paper are black and white reproductions of colored patterns observed during the actual experiment. Furthermore, in this method of photoelastic stress measurement, the interpretation of colored patterns, per se, is essential to a total analysis of the stresses involved.

Typical colored photographs obtained indicate that:

1. A stress-free control model with no force applied shows an absence of any stress pattern.

2. As force is applied, the first colors to appear in the stress picture are in the red part of the spectrum. As the force increases, a complete spectral band is formed with the blue part of the spectrum appearing last.

3. As a corollary to Paragraph 2, the greater the applied force, the greater the number of spectral colors appearing per band.

4. As the force is increased in magnitude, the number of complete spectral bands visible also increases.

Fig. 5. Fig. 6.

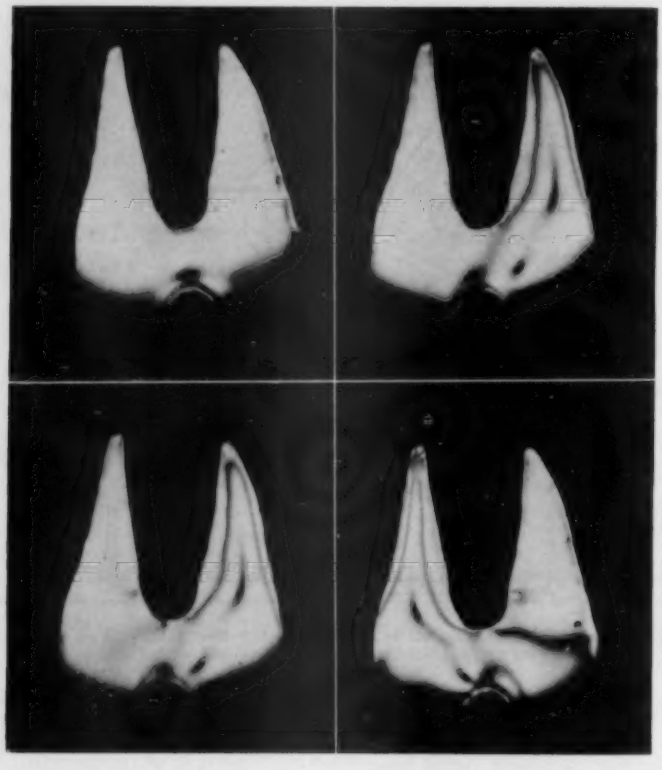

Fig. 7. Fig. 8.

Fig. 5.—Control stress free.
Fig. 6.—Labial tipping.
Fig. 7.—Labial torque.
Fig. 8.—Lingual torque.

ORTHODONTIC IMPLICATIONS OF THE PHOTOELASTIC METHOD OF STRESS ANALYSIS

Orthodontic forces applied to the teeth are directly transmitted to the surrounding bone socket through a slightly compressible elastic membrane. This membrane, the periodontal membrane, which serves as an attachment of tooth to alveolus and also as a stress distributor, may therefore be excluded as a mechanical factor in the analysis of forces.

The validity of a bone-plastic analogy may thus be resolved:

Although the vital factor of cellular bone response is absent in a nonliving plastic material, the pressures that exist at the adjoining tooth-alveolar bone surfaces also occur in the experimental model.

The direct contact of tooth and bone socket surfaces thus permits externally applied forces to be measured by the strain patterns. The size, shape, color, and location of the stress bands all serve to indicate the distribution of force along the root-bone junction.

As orthodontists we know that force of a certain magnitude and direction will usually produce a proportional tooth movement. A further practical orthodontic application of this photoelastic technique is thus suggested.

A suitable model is constructed as described. A specific area of the plastic bone socket adjoining the tooth is then marked off for isolated study. A force of known magnitude is applied and the number of stress bands passing through the area are counted. Numerous areas of the socket may be studied and, for a given force, a specific number assigned to each. Any clinical orthodontic situation may be reproduced and studied by the photoelastic measurement of the applied force. We are thus able to quantitate applied forces more accurately, so that force, in a given clinical situation, is measured by the number of stress bands per unit area.

This experiment has employed a two-dimensional technique of photoelasticity. Further investigations are therefore indicated to study the problem in its true three-dimensional aspect.

SUMMARY

A transparent Bakelite model of a bone socket was constructed and an acrylic tooth model was fitted and adapted to it. Several types of orthodontic forces were applied to the crown portion of the tooth model.

On viewing the transparent material of the bone socket through a polariscope, the internal stresses set up in the Bakelite model were photographed.

The patterns of stress observed in the photographs were related to the magnitude and direction of the applied forces.

The correlation of orthodontic principles with the experimental results is discussed.

The authors wish to express their gratitude to Mr John McKay, Technical Director of the J. M. Ney Company for allowing them the use of the Ney polariscope, and to Dr. Herbert D. Ayers, Jr., Dr. Max J. Pleasure, and Dr. Abraham G. White for their helpful suggestions in the preparation of the manuscript.

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SUGGESTION: AN ADJUNCT IN ORTHODONTIC TREATMENT

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IN ENDEAVORING to present this subject, I wish to confine myself to the fact that I am an orthodontist, and am submitting this method of therapy for academic enlightenment.

Dentists and orthodontists have problems with some children. Often a child is nervous and apprehensive of pain, or becomes nauseous when radiographs or impressions are taken. Then there are the problems of overcoming habits which are detrimental to the normal development of the dental apparatus, and the problem of correcting functional disorders relating to the oral condition.

It has been the practice of most orthodontists to stress the importance of, and limit themselves to, the correction of the anatomic abnormalities found in the oral cavity. However, it has been my experience over many years that this is a narrow and shortsighted limitation. In a great many instances the accompanying psychic and emotional factors are overlooked and completely underestimated.

For fear of being misunderstood, let me stress the point that I am not minimizing the traditional classical mechanical therapeutic measures well known to all orthodontists. However, as has been particularly emphasized during the past few years, even in general medicine, reliance upon the structural theory of disease in many instances has been abandoned.

The insertion of a mechanical appliance will not produce a satisfactory result unless the contributing factors producing the malocclusion have been eliminated or overcome. Unsuccessful orthodontic results or prolonged treatment may be due to a perverted habit, abnormal muscular function, nasorespiratory dysfunction, improper speech, or the lack of cooperation.

Successful orthodontic service, besides biomechanics, incorporates several phases of endeavor, such as proper office administration, diagnosis, appliance therapy, and a knowledge of child psychology.

Proper office administration is of distinctive value in any field of endeavor, especially when dealing with children. Children are very instinctive in forming opinions, and it is usually to either like or dislike a person at the initial meeting. A well-arranged office and a personable staff help immeasurably in forming a favorable impression. In many instances, it is the child who chooses the orthodontist, and sometimes rightfully so. Many times the child will say, "I like the doctor," or "I like the nurse." One should remember the biblical expression, "A Child Shall Lead Them."

Child psychology is extremely interesting and, after many years of observation, a new phase of patient handling which I have developed and employed has proved quite helpful in orthodontic practice.

This brings me to the topic of my thesis—the role of psychic and emotional factors in the management of oral rearrangements.

As in medicine, the orthodontist finds that management of the local condition per se without regard to the individual who is the sufferer of the abnormality is very much like going into the rain with a cane instead of an umbrella. By this I mean that one must not separate the orthodontic problem from the patient, e.g., the handling of an orthodontic problem cannot be successfully accomplished without the consideration and analysis of the personality, the environmental background, and other factors which the patient has to contend with. I should like to elaborate on one phase of this with which I have had the privilege to experiment. What bearing have the emotional and psychic factors on successful management of the orthodontic patient? With this end in view I will briefly cite a few of the very many cases that unequivocally prove the value of treating the patient as a whole rather than as a given orthodontic problem.

Suggestion does not belong entirely in the field of medicine since it is practiced in psychosomatics, but it does have a definite place in orthodontics. The orthodontist has the unique opportunity of handling children whose mental capacity is developing and in a formative stage. His young patients afford excellent subjects for the study of child behavior problems. The orthodontist not only corrects dental deformities, but also aids in developing a dentist-patient relationship.

Treatment of a child over a period of two or three years does not completely discharge an orthodontist's obligation. Since a child has to attend the office for the longest interval of dental treatment, the orthodontist has an opportunity of either creating in the child a like or dislike for dentistry. Many times children go for orthodontic treatment much against their wishes, not because they do not want their teeth straightened, but because in many instances an impersonal relationship exists between the practitioner's office and the patient. It may be due to the operator's mannerism (operator being the orthodontist) or the behavior of the dental assistant, thereby creating a psychological breach.

Suggestion is a method of therapy which can be successfully employed in dental practice. It is divided into two phases: the conscious phase and the subconscious phase. In the former, the subject (the patient) is aware of the suggestion and is receptive to the recommendations and instructions which are directed to him.

In the subconscious phase known as the hypnotic trance, the subject is in a state of somnolence but will be able to hear and speak to the operator, and yet not remember the incident. Hypnosis is employed as an instrument in suggestion, a method of therapy. The state of hypnosis varies from a light trance, in which the subject may remember what has occurred, to the deeper stages of somnambulism and amnesia.

Suggestion is defined as "the implanting of an idea on the mind of another by some word or act on the part of the operator, the subject being more or less influenced in his conduct or physical condition by such implanted idea."[1]

As pointed out by LeCron and Bordeaux,[2] "Professional men, such as lawyers, doctors and dentists learn by experience the value of prestige in their practice. Their appearance, as well as the office, must be dignified. . . . Suggestion depends too much on the faith for these matters to be neglected, and mere faith in the physician has cured many an ailment."

Autosuggestion on the other hand may be described as follows: (1) the voluntary retention and constant dwelling upon an idea or concept, thereby inducing some change in the mental or bodily functions; (2) the reproduction in the brain of impressions previously received which become then the starting point of new acts or ideas.[1]

In order to understand the psychological application of therapy, one must rationalize the need for its use. Much valuable productive time is lost in handling patients who are unmanageable, uncooperative, and mischievous. Numerous instances can be given in which children are deliberately uncooperative, and in that way prolong the period of orthodontic treatment and are responsible for many nonproductive working hours.

I might take the liberty of coining a definition for nonproductive orthodontic treatment by stating that it is the time spent in readapting, repairing, or resetting appliances which were broken or distorted due to carelessness or mishandling of the appliance by the patient. It also includes time spent in cleaning teeth which have accumulations of food debris in and about the appliance.

In order to substantiate this phase of orthodontic consideration, I took a random survey of sixteen patients who were to be treated during one afternoon. The following observations were recorded and the number of recurrences noted commencing with the patient's first visit for treatment:

1. Number of resets.
2. Number of repairs or lost appliances.
3. Number of postponed appointments.
4. Number of broken appointments.
5. Number of times patient was called to task about not wearing elastics, keeping teeth clean, or doing exercise.
6. Number of times letters were sent to parents regarding proper cooperation (referred to as "stress" on chart).

Out of a total of 967 visits for orthodontic treatment, 335 or 35 per cent were nonproductive. Two out of the sixteen patients showed complete cooperation. Four patients had less than 20 per cent nonproductive visits, and the remaining ten patients ranged between 23 and 64 per cent nonproductive visits. These findings are only preliminary conclusions but they confirm the clinical observations which show that a lack of cooperation is a barrier to rapid and successful orthodontic results. (Table I.)

Many patients will express thanks and gratitude at the completion of treatment and often will convey the thought that they regret not having been a more cooperative patient. They will admit to having indulged in sticky candies, chewing gum, and tampering with the appliances as indicated by the findings listed on the accompanying chart.

TABLE I

CASE NO.	VISITS	TO CLEAN MOUTH	STRESS	RESET	CAUTION	BROKEN	B.A.	P.P.	REPAIR	REMAKE	PER CENT
1224	69		2	1				8	1		16
1163	121	6	18	14			9	18	2		55
1352	84		8	12	3		6	2	4		41
1251	109	4		8	1	1	3	16	4		33
928	135	2	3	14	1	4	5	9	5		32
1471	87	11	3	5	1		12	11	1		50
Z447	26	2		6	1						33
1922	21						3				14
1775	33		1	1			1	1			12
1872	25										--
1339	79		8	1			3	4	2		23
1947	14										--
Z438	35			1				1			7
1893	17	1	3					2			33
1598	68	1	2	4		5	3	9	3		40
1736	44	5	3	6		1	2	1	8	2	64
Totals: 16 patients	967	32	51	73	7	11	47	82	30	2	35

Conclusions: 35 per cent mishaps; two patients no trouble; four less than 20 per cent poor cooperation; ten ranging from 23 per cent to 64 per cent.

One of the greatest contributing factors producing malocclusion is mouth breathing and its associated dysfunction of muscular activity. Most conditions of Class II, Division 1 cases are subject to mouth breathing. From statistical findings,[3] 50.5 per cent of the cases treated for malocclusion belong to the Class II, Division 1 classification. This does not, however, include the mouth breathers who may be in Class I, Class II, Division 2, or Class III. With proper suggestive therapy mouth breathing can be overcome unless complicated by a nasal obstruction.

The proper psychological approach is initiated the first time that a child calls for examination. After the receptionist greets the child and the parent, she makes them comfortable, and has them ready in the consultation room for examination. It is important that one knows in advance the child's first name and who accompanies the child. A cheerful greeting should be extended the child and the parent, and the youngster is greeted by his first name. This simple procedure usually plays a very significant part in establishing a kindred relationship between the young child and the doctor. By the time the examination is completed a friendly and warm relationship has been developed between the child and the office.

Many times a parent may be unimpressed for one reason or another, but invariably the child contributes a great deal toward influencing the parent to accept treatment at this office. The application of suggestion is instituted at the first operative procedure. This may sound elementary, but it is important: a drinking cup is inserted into the cup holder and a towel is taken out of the cabinet after the patient is seated. This suggests to the patient that he is using an unsoiled cup and a fresh towel and conveys the impression of cleanliness and orderly procedure. In addition, both the assistant and the doctor wash their hands in the presence of the patient.

When the patient is being prepared for radiographs or impressions, the following remarks are avoided: "This won't hurt" or, "This might gag you," or, "It will only take a minute so don't worry." I have found that these create apprehension and a fear of pain. Rather, it is advisable to say in taking radiographs, "I'm going to take a picture of some of your teeth. I am going to put this piece of paper in your mouth and all you have to do is sit quietly and breathe in and out all the time." This, as well as other suggestive methods, is delivered in a slow, quiet, and friendly tone of voice, sometimes almost to the point of a drawl.

When taking impressions, before the child sees the tray he is instructed as to what procedure will follow. Usually I tell the child, "We are going to fit a little dish or a little tray in the mouth and if that is of the correct size we will put in some impression material, which looks and tastes like chewing gum or ice cream (depending upon the material used). All you have to do is to keep your mouth open and breathe in and out at all times." The faster the child breathes, the easier it will be. The first impression is usually taken of the lower jaw since that is the part of the mouth less likely to disturb the child. At this point it is advisable to flatter and make comment on the splendid cooperation. After this is accomplished, the child will have been inspired with confidence and therefore will cooperate more readily.

The same procedure can then be followed for the upper impression. Once the impressions are taken, the matter of handling the child is a simple one unless some incident occurs which is unpleasant and distasteful to him, thereby setting up a mental trauma which may interfere with the simple way of handling the patient. This brings us to some of the problems that we encounter in our daily practice, and I will cite a few cases to indicate the lack of cooperation on the part of the patient.

There is a case I have in mind which is classical for storytelling in orthodontic circles. I was treating a young girl, about 14 years of age, with discouraging results. She had a marked underdevelopment of the mandible, and the teeth in the maxillary arch were in good alignment, confirming the Hawley chart. In the maxilla she wore a ribbon arch with bracket bands on the anterior teeth. In the mandible she wore a Mershon lingual appliance with intermaxillary spurs on the buccal surfaces of the bands.

Each time the girl sat in the chair ready for treatment I would ask, "Phyllis, are you wearing your elastics?" She would deftly push out two No. 5 elastics with the tip of her tongue. (As is well known, some youngsters have the art of removing elastics with the tip of the tongue by sweeping it from one side to the other.) She would not answer, but the implication was to the affirmative. At one visit I decided to check every possible angle and noticed that the mandibular intermaxillary spurs were caked with food debris, and that it was impossible for an elastic to be put in place. I told the girl to put the elastics on while I treated a child in another room. After a long interval I returned, and she started to cry, asking that I do not tell her father about her

behavior. She admitted this deception had been taking place a long time. Of course, the parents were informed, and the child had a satisfactory response after the hazard was removed.

I have another case on record of a young boy about 13 years of age, N. K., who, for the last six months, has been showing an unfavorable response. The condition was a Class II, Division 1 malocclusion which was rapidly developing into a bimaxillary distoclusion. At each visit the child would state that he was wearing his elastics and doing his mandibular developing exercises. At the last visit, it was decided to send for the parents and discuss the advisability of removing two maxillary teeth in order to reduce the size of the arch. When the mother called at the office with the child she was almost hysterical in reaction to what we contemplated in order to complete treatment. However, from the time of the last visit, when a letter was sent to the parent, until the parent appeared with the child there was a lapse of about three weeks. During that time the child became very conscientious, both in the wearing of his elastics and doing his exercises.

When the patient presented himself at the office there was an entirely different appearance about the mouth. The mother then told us that she had known all along that her son was not cooperating and kept threatening him that she would inform the office about his lack of cooperation. She thought each day, however, that he might change, but upon receipt of the letter about the possible extraction of teeth, all concerned became very conscientious and cooperative, which resulted in a more favorable appearance. The method of handling this patient may be termed persuasion.

SUGGESTION THERAPY FOR MOUTH BREATHING

Mouth breathing is nothing more than a habit in the majority of patients who are afflicted with this dysfunction. In a great many instances the patients have invariably had their tonsils and adenoids removed, but still maintain this abnormal function. This can be attributed to the fact that these patients should have been instructed in the correct re-educational exercises to establish normal breathing. As a result, many of these youngsters who, at an early age, continue with mouth breathing, develop Class II, Division 1 malocclusion and contribute considerably in accentuating the degree of the deformity. Associated with the dentofacial deformity we also have abnormal muscular function and, in a great many instances, speech defects. The child should be instructed in the normal breathing exercises, such as standing erect and raising the arms sideways as a deep inhalation is made through the nose with the lips perfectly sealed; then the child exhales through the mouth.

The children are told to do these exercises morning and night, starting with eight times both in the morning and evening, and increasing it daily until a limit of twenty times is reached. They are also instructed to keep the lips closed at all times and practice breathing through the nose. Before these directions are given, we usually show a boy or a girl unsightly, disfigured pictures of their respective sex and comment, "Do you want to look as horrible as this?"

The answer invariably is no. Thus the suggestion is made and there is usually no difficulty in getting the child's cooperation without severe rebukes or scoldings.

SPEECH THERAPY

Speech defects are due to an abnormality of the speech mechanism or some psychic factor of conflict or frustration. If the condition is of organic origin, then the correction is beyond our capacity of treatment. However, if it is of a functional nature, or associated with a deformity of the jaws, we are then able to be of some assistance. During the process of correcting the deformity, speech correction instruction is necessary, and the patient should be referred to a school for speech correction.

Speech defect is often a contributing factor in malocclusion. Inadequate use of the mandible in articulation of speech tends to inhibit the functional growth of the mandible. This is mentioned here as I wish to correlate speech exercises with the wearing of the removable appliance. The greatest difficulty in wearing these appliances has been in the child's inability to speak correctly or function easily. At the first visit, sufficient time should be devoted to the child to instruct him in the proper speech exercises and the correct application and use of the appliance. It is only with a maladjusted child that difficulty may be encountered, and these cases in my experience have been relatively rare.
After the appliance is properly fitted and balanced, the patient is instructed in its use and function. The importance of wearing the retainer at all times is emphasized, as well as proper hygienic care. The patient will mention that he finds it difficult to speak with the bite plate. The following instructions are given:

The patient is told to hold the teeth in centric and, without articulating the teeth, to repeat several times, "She sells seashells at the seashore." Then the patient is told to attempt to simulate the same sounds by articulating the teeth properly. It will be noticed that after a few moments there will be no difficulty in diction. The best results are obtained by practicing this method slowly, and using any combination of words with the letter "S." When the patient leaves the office, he feels quite confident that he is capable of wearing the appliance and speaking with it. By this means, the correct sound and function idea is implanted into the subconscious mind, and invariably becomes a reality.

BREAKING OF HABITS

There is no question that orthodontic success cannot be achieved unless all abnormalities contributing to the etiology of the individual case have been determined and corrected. Common among the etiological factors in most Class II, Division 1 conditions is the thumb-sucking habit. Unfortunately, the parents of our patients have been advised by their medical men not to attempt breaking the child of this habit. Consequently, the deformities as we see them many times are extreme. During the past twenty-five years, in breaking numerous children of the thumb-sucking habit, I have yet to note one who has diverted to another habit as a substitute for the one which we broke. This is based not upon hearsay

but upon clinical findings, and we have found no proof or substantiating evidence to support the assumption that the child will revert or acquire some other habit.

The simplest way of handling the thumb-sucking problem in the younger child is to gain his confidence without discussing the habit condition. Only after a friendly or kindred relationship exists between the patient and the doctor can one then intelligently handle the problem independent of the mentality of the subject. It should be explained to the child what the habit is doing and how it will affect his physical structures. I usually show a picture of a young boy or girl sucking the thumb and then say, "Now doesn't he look ugly? This is what you look like when you suck your thumb. You don't want to do that any more, do you? You're a big boy now." Invariably, the child will say that he would like to stop but that he cannot. In that case I say, "I can help you if you want me to, but you must cooperate."

I then relate a story to the child, in the presence of the mother, that when the mother was a little girl she used to run errands for her mother, but when she would get to the grocery store she would forget what to buy. Then the grandmother would have to tie a little string on mother's finger to remind her of what to do. To the child I say, "If you want to stop this habit all we're going to do is have you put up your finger (offending thumb) and tell your mother to wrap a piece of adhesive tape around your finger just to remind you not to suck it." This tape should be continued for about ten days to two weeks, occasionally even a month, which is invariably sufficient time to break the habit. When older children are encountered, it becomes a little more difficult, and with them, in the trend of thought commensurate with their mentality and with a little firmness, we instruct the mother very emphatically to get some dirty electrician's tape and put that on the finger. Often the child will say, "That'll make me vomit" or, "That'll make me sick." Then we say, "Well, then you won't put your finger in your mouth." This helps where the other methods fail.

I recall one case, a young girl, L. S., who was a violent thumb-sucker. Although we were under the impression that the habit had stopped, she continued this thumb-sucking while reading, of which she did a great deal. The degree of force used in her thumb-sucking habit can best be understood from this description. In the maxillary arch, with the anterior teeth banded, an 0.022 inch by 0.036 inch ribbon wire was used, the wire and teeth were brought out labially, and in the mandibular arch, where the incisor teeth were banded and had an 0.022 inch by 0.025 inch wire in place, the anterior teeth were concaved lingually by this terrific force. Spiked appliances were also used, but to no avail. As a result, we had to subject this particular patient to a deep hypnotic sleep in which she was given a posthypnotic instruction that whenever she put the finger into the mouth it would have a very unpleasant taste and she would become sick to her stomach as long as the finger was kept in her mouth. This therapy was employed as a last resort and proved successful.

Our method for determining a child's receptivity to suggestion is only used with children when there is some difficulty in taking either radiographs or impressions since spontaneous suggestion is not always successful. We, therefore,

employ suggestion in the following manner: The child is asked to extend both hands and clasp the fingers together very firmly and then, looking directly into his eyes and speaking with a low, soft, pleasant yet firm tone, he is told to repeat to himself that his fingers are so tight together that he cannot take them apart. This is repeated a number of times, and when a slight blanching of the fingers is observed the patient is told, "You cannot take your fingers apart. They are so tight together." When a patient has difficulty in separating the fingers, it is then determined that he or she is receptive to any conscious suggestion that may be made and the proper cooperation will be obtained.

Another patient, a young man of about 16 years, was very sensitive and would gag when an instrument or a finger was placed in the area of the mandibular first molar. It was necessary to take radiographs of the mandibular molar areas. The conscious suggestion was made after a number of gagging reflexes were noted. After the suggestion, the x-rays were taken without any difficulty. The patient then declared, "I bet you were trying to hypnotize me. Why, you can take these x-rays of me now without all this hokus-pokus," and sure enough, the x-rays were retaken without any gagging reflexes. This phenomenon is known as autosuggestion.[4]

SUMMARY

To summarize, I have enumerated a limited number of subjects in which I have been successful in accomplishing a local orthodontic result only because I have also considered and utilized extraoral factors which I believe are important in accomplishing such results. The factors which I believe should be part and parcel in the handling of the orthodontic patient are:

A. Local problems and the immediate underlying physical abnormality.

B. The family background which contributes to the part that constitution plays in the abnormality.

C. Environmental factors, such as behavior problems, lack of cooperation, emotional and psychic escape mechanisms.

D. For alleviation of the factors not directly connected with the abnormality, psychoanalysis and suggestion therapy have been utilized.

It is my belief that mechanical means will not always produce a successful result without consideration for the extraoral factors. Consideration must be given to maintaining a proper doctor-patient relationship. This can be readily accomplished with an understanding of child psychology.

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THE DENTIST AND THE ORTHODONTIST—A STUDY IN INTEGRATION

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IN THE past decades specialization in all fields of human endeavor has developed to such a point that one of society's major problems of the moment is the integration or coordination of the knowledge and activities of men in allied areas of endeavor. We have sometimes been critical of labor groups because the electrician will not do plumbing and the engineer will not repair the locomotive; but actually the situation is broader than labor groups, and extends into practically all professions. In the field of religious education the directors are now trained either for childrens' work or adult work, and subdivisions within these divisions are appearing. Therefore, it is not surprising to find that the dentist and the orthodontist have grown farther apart in their actual functioning. This gradual tendency for each specialist to isolate himself even from his professional first cousins is simply a reflection of the age in which we live, and no one can be said to be to blame for it.

Specialization is necessary because of the vast amount of knowledge which we have accumulated, but strenuous efforts must be made to integrate the information in the various specialized fields and to coordinate the application of such information in actual everyday work. Certainly the dentist and the orthodontist are no exceptions to this problem. The purpose of this study was to make a preliminary investigation of some aspects of the interrelationship of these two professions, and to make a few suggestions for their improvement. It is realized that this study is not conclusive; but it is somewhat of a "feeler" which might lead to more elaborate investigations and recommendations later.

One of the accepted techniques for the study of human attitudes is the questionnaire study. Many times we are annoyed by the blanks we must fill out for this or that purpose, but, nevertheless, from such sources have come items of knowledge which have added to a better understanding in our present world. One way to discover how the dentist feels about his relationship to the orthodontist is to use the questionnaire method. If this method were to be used two precautions would have to be taken. In the first place the orthodontist himself could not be in the foreground. The factor of individual personality and of the personal relationship between himself and the dentist would be too vital in influencing the answers given by the dental profession. It is therefore necessary that an impersonal medium be used for the acquisition of such data. In the second place a questionnaire cannot be constructed without some experience of a subjective sort as a preliminary feature, so that one might know exactly

what items should be included in the questionnaire and just how they should be expressed. To meet this problem, a series of interviews were conducted on an impersonal level. This seemed to be the best answer.

The services of a man trained in psychology testing and interviewing were secured. His first activity was to familiarize himself with the work of the orthodontist. He studied the office organization, the record system, the data relative to types of referrals from dentists and other doctors, the activities of the various members of the office staff, and insofar as possible became well acquainted with the current functioning of the orthodontist's office. (In making this intensive study the psychologist made some very helpful suggestions regarding the record system of this particular office which were immediately put into effect.)

After having acquired a keen insight into the activities and problems of the office he conducted a series of interviews with the dentists. A very wide sampling was taken from the various sections of the area and included many dentists who did not refer cases, as well as many who did. All were informed that their information would not be quoted by name, and that the results would be treated as a statistical whole.

With the interviews serving as a basis, the investigator, with the help of the orthodontist, constructed a brief questionnaire. This was administered to a large group of dentists, including a number outside of the immediate vicinity. These results were treated statistically and final implications drawn.

THE INTERVIEWS

Approximately fifty interviews were held. Of these, ten were so brief as to be of minor value, except for confirming certain ideas secured from the more successful interviews. Fifteen interviews were most satisfactory, lasting approximately a half-hour each, and characterized by frankness and cooperation. The remaining interviews were quite long and thorough, and were most helpful in bringing into some sort of organization or focus the data which had been acquired. Comment should be made on both the high spirit of cooperation and the sincere degree of interest shown by the cooperating dentists.

The interview results were organized under two headings; general attitudes and specific problems. It should be remembered that these results are presented as attitudes of mind. They may or may not be true, in fact, but there can be no doubt but that they do exist as attitudes. They must, therefore, be taken into account as functioning ideas, even if we question their factual validity.

General Attitudes.—1. Many dentists regard the orthodontist as a "specialist" whose income is much larger than the extent of his specialized training would justify. It is interesting that several of the dentists who voiced this attitude did so with a sense of humor, indicating that there might be a certain element of envy mixed up in the attitude. It was also felt that as standards for the training of orthodontics became more rigid the attitude that the orthodontist was a recognized specialist would improve.

2. There was a general opinion voiced that the orthodontist tended to limit his interest strictly to his narrow field, and that he had lost interest in the

general problems of dentistry. An illustration was made of the point that orthodontists went to dental meetings and segregated themselves to talk of their own work, and showed little concern with the over-all development of the whole professional problem.

3. A small group of those interviewed expressed the thought that if orthodontics was a good thing for the well-to-do patient it was also good for the people less able to pay for the cost of treatment. The belief was brought out that the dental profession as a whole was showing concern about the problems of dental health of the population, but that the orthodontist had not yet faced the challenge of planning for the expansion of the services of orthodontics on a broader scale.

Specific Problems.—1. Interview data revealed that the dentist and the orthodontist had no mutual understanding concerning who should educate the patient about the nature and purpose of orthodontics. Some felt that it was the dentist's responsibility to explain the need and the procedure of orthodontics to his patient as he referred him; still others felt this was the problem for the orthodontist himself, and a few believed that it should be a joint project. From the patient's point of view it is most important that someone perform this educational function for him, and it is quite possible that in the confusion as to whose responsibility it is, the job may not be done at all. It would seem that there should be some uniformity of procedure in the profession on this item.

2. The suggestion was made during the interviews that the orthodontist had a new field awaiting him if it were properly developed. This field would consist of working with adults in certain types of bridge replacements—which the dentist might refer to him. The point was brought out that such work would have to involve a system of scaled prices, varying with the complexity of the work; some felt that the orthodontist would not be inclined to do such work at a reasonable figure.

3. There was strong feeling that a major failure of the orthodontist was not providing more adequate advance notice as to the dates when appliances were to be removed temporarily for the purposes of cleaning and filling teeth. The dentists felt that their schedules were constantly being upset by patients who called and said the appliances were off only for the next week or so, and that appointments had to be made for necessary dental work at once. The dentists felt that advance notice of from four to six weeks should be given them. The point was made that the orthodontist had given the patient more notice, but that the patient had neglected to see his dentist and make the appointment for this period in advance, as he could very easily have done. The answer of the dentists was that the orthodontist should notify the dentist, and not just the patient, in advance of the removal of appliances.

4. The dentists expressed the desire for reports from the orthodontist on patients whom they had referred to him. In most cases the referrals from the dentist are not professionally recognized. Also, a brief statement of diagnosis and later of progress should be made by the orthodontist to the referring dentist. The further suggestion was made that in unusual cases which might have scientific interest the orthodontist might send the "before and after" photographs

or models of the patient's mouth. Such a gesture would indicate the sharing of professional interest in unusual dental problems.

5. The interrelationships of the orthodontist and dentist might constitute a good topic for discussion at professional meetings. It was indicated that orthodontists sometimes talked to dental groups but that the practicing dentist was not as a rule ever invited to talk before a group of orthodontists. Cooperation between groups would be facilitated by more interchange of information on the mutual problems shared by these two groups.

6. The point was brought forth that both groups should resist the tendency for the pressure of work to prevent them from visiting each other's offices. Even very brief visits during working hours might improve the feeling of sharing interests and purposes.

THE QUESTIONNAIRE REPORT

A study is under way to determine the possibilities of improving the coordination of the orthodontist's work with that of the dentist. Your judgment on the following points will be most appreciated.

1. When the dentist recommends orthodontics to a patient

---- a. He should assume the responsibility of educating the patient or his parents about the nature of orthodontic treatment.

---- b. He should leave this function entirely to the orthodontist.

---- c. He should provide an understanding of what an orthodontist is, but should leave the main responsibility for educating the patient to the orthodontist.

2. After the patient has been referred to the orthodontist the dentist should expect from the orthodontist

---- a. Reports on progress each six months.

---- b. A report of the diagnosis and final report at the completion of treatment.

---- c. No reports at all.

3. In order that the patient may be treated for cavities, etc., during treatment the dentist should be informed in advance of the dates of temporary removal of appliances. This removal should be done according to the condition existing in the patient's mouth, such as

---- a. Each three or four months.

---- b. Each six months.

---- c. Each nine months.

4. The general practitioner may assist the orthodontist in a number of ways during the course of treatment. Check as many of the following as you think are part of the dentist's responsibility, and add any others not stated.

---- a. The dentist should help maintain the patient's attitude toward the value of orthodontic treatment, even though the period may necessarily be prolonged.

---- b. The dentist should encourage the patient to follow the orthodontist's directions explicitly.

---- c. The dentist should meet emergencies such as slight injuries to appliances in cases in which the patient lives far distant from the location of the orthodontist.

5. In the event that the dentist should observe cavities developing which should have immediate attention he should

---- a. Request the orthodontist directly to remove all appliances.

---- b. Request the parents of the patient, or the patient, to arrange for the removal of the appliances.

Item 1.—"When the dentist recommends orthodontics to the patient" was formulated to secure data on the question concerning the responsibility of educating the patient in regard to the nature and purpose of orthodontics. Is this the dentist's responsibility, or the orthodontist's task? Or is it a problem in which both must participate? The results were as follows: two answers indicated that this was the dentist's responsibility; nine indicated that it was the task of the orthodontist; sixty indicated that it was a joint responsibility. (A total of more than sixty-seven resulted because a few checked more than one item.) There were numerous marginal comments to the effect that the dentist should explain the general nature of orthodontics, but that the orthodontist should provide the detailed understandings regarded as highly significant. The dentists do not believe it is their function to educate the patient regarding orthodontics, but they do recognize their part in the joint responsibility.

Other marginal comments were to the effect that the orthodontist should provide an educational pamphlet for the use of dentists with their patients, such data not to carry the names of particular orthodontists, but to be issued by their professional organization.

Item 2.—"After the patient has been referred to the orthodontist the dentist should expect from the orthodontist" dealt with the question of reports from the orthodontist to the referring dentist. The space provided allowed the question to be answered by one of three solutions: (a) reports on progress every six months; (b) report of the diagnosis and a final report on completion of the treatment; or (c) no reports at all. The responses to this item were more varied than the first item. There were twenty-four checks for the reports each six months; forty-two checks for reports of diagnosis and the final reports; ten checks for no reports at all. Again we noticed that several dentists checked both their first and second choice.

It is significant that only ten of the sixty-seven dentists favored no reports at all. The great majority desired to have a report. The question concerned the frequency of the reports. In this respect the majority may be regarded as favoring a report of the diagnosis and a final report on the results of the course of treatment. However, a significant number indicated that they would appreciate reports each six months.

It will be recalled that one of the problems raised during the interviews dealt with the relationship of the dentist and the orthodontist concerning the removal of appliances for the purpose of cleaning the teeth and checking for cavities in the patient's mouth. Although the question which concerned the

dentists in the early interviews was the need for early notification as to dates when appliances were to be removed, there was considerable disagreement in these discussions on the corollary question as to how frequently the dentist needed to have access to the patient for this purpose. It was for this reason that Item 3 was included.

Item 3.—In this question the dentists were asked whether they should have access to the patient every three, six, or nine months. The answers distributed themselves as follows: sixteen checked every three or four months; fifty checked each six months; and none checked every nine months. One failed to answer this item. It will be seen that the large majority favor the six-month interval. A few thought three or four months would be better, and none favored a period as long as nine months. Four men wrote on the margin that the period might be somewhat variable, depending upon the patient's condition from a dental standpoint.

It should be said that during these interviews some feeling was expressed that orthodontics was hard on the patient's teeth, and that some orthodontists were not as aware of this fact as they should be. It is possible that this factor is partially responsible for the insistence by the dentist of seeing the patient each six months. It is also of interest that a number of dentists wrote in the comment that such appointments should be accompanied by an "advance notification." These comments bear out the point that was discovered in the interviews that the dentists feel that they are not adequately notified as to dates of the removal of appliances.

The investigator was curious to know the extent to which dentists were interested in cooperating with the orthodontist in the continuing treatment of the patient. For this purpose Item 4 was included. This item is in the copy of the questionnaire presented previously, but is repeated for emphasis at this point.

Item 4.—The general practitioner may assist the orthodontist in a number of ways during the course of treatment. Check as many of the following as you think are part of the dentist's responsibility, and add any others that are not stated.

---- a. The dentist should help maintain the patient's attitude toward the value of orthodontic treatment, even though the period may be necessarily longer than anticipated.

---- b. The dentist should encourage the patient to follow the orthodontist's directions explicitly.

---- c. The dentist should meet emergencies such as slight injuries to the appliances in cases in which the patient lives far distant from the location of the orthodontist, and it was not convenient to go for immediate treatment.

---- d.

The checks on these items were as follows: On "a" we received fifty-seven checks; "b," sixty-five checks; "c," fifty-five checks. There were numbers of various comments in the space provided ("d"). It was most encouraging to

see the large number of checks on these three items. Apparently the dentist is aware of the opportunity and the responsibility of supporting the orthodontist in every possible way.

Some of the comments under the heading "d" were interesting. For example, "The dentists should refrain from telling the patient and possibly the parents that appliances ruin teeth." Another dentist says, "A conscientious dentist isn't going to refer a patient for special treatment without the utmost personal confidence in the special work. Therefore, the fullest cooperation should be given."

A good example of providing support is found in this statement: "The dentist should praise the progress of the orthodontist even though the case may be developing slowly."

The spirit of cooperation in the dentists shows up well. It should prove valuable to secure similar questionnaire data from orthodontists on their beliefs concerning their responsibility to cooperate with the referring dentist. One comment of the dentists was: "I think an ethical orthodontist will uphold his confidence just as an ethical dentist," that is, consider the welfare of the patient first and then the dentist or the orthodontist.

Item 5.—Another problem of a rather specific sort which arose involved the situation of the practicing dentist observing cavities developing while the patient was still under treatment with the appliances intact. Should the dentist request the orthodontist directly to remove the appliances, or should the request be made to the patient or his or her parents and let them request the orthodontist to remove the appliances for this purpose? The problem here is one of professional interrelationships. The results indicated an almost even division of thought. There were thirty-one checks for the first point of view; thirty-three checks for the second point of view. Three dentists did not check either item. There is no clear picture of just what the procedure in this case should be. Perhaps a standard procedure is not necessary, but it would seem that the profession should develop a general policy in such professional relationships. It was felt that on this item more study will be necessary before any conclusion may be drawn other than the fact that there is no consistency of attitude or of practice in this regard. The questionnaire was accompanied by many comments. Some of them are included in this report as examples of the thinking which the questionnaires brought to light:

> After the patient is referred to the orthodontist there is in many cases quite some time before the dentist sees the patient again. During this time the orthodontist is seeing the patient regularly. He should be constantly on the alert for beginning cavities, in order that the patient may be referred to the dentist for correction. It is a cooperative pattern, and both have important parts to play if the best interest of the patient is to be protected.

A rather long commentary by another dentist is so well stated that it might have formed the introduction of this paper.

> In my opinion, the treatment of patients referred for special work by general practitioners of dentistry should be of mutual cooperation between the parties involved, each feeling free to report to the other any condition necessitating treatment by the other. I do

not think special treatment should be supervised by a dentist, neither do I think filling of cavities should be supervised by anyone else. The specialist would certainly be derelict in his duties if he discovered conditions in the patient's mouth and did not send the patient back to the proper place to have the work done. The dentist would certainly be derelict if he did not send the patient back to the orthodontist if he had an injury to the appliances.

To my mind, every question involved can and will be rightfully solved by an ethical dentist and an ethical orthodontist, because each owes his best services to his patients. The general practitioner of dentistry cannot give the best orthodontic treatment any more than the orthodontist can be expected to make the best acrylic bridge. The general practitioner of dentistry can certainly do much toward creating the right attitude of the patient and the parent toward the orthodontist.

A number of other comments were made to the effect that the questionnaire was a "step in the right direction" and that it "constituted a good idea."

SUMMARY

By means of interviews and questionnaires a few problems relative to the interrelationships of the dentist and the orthodontist have been explored. The dentists who were asked to cooperate were found to be eager to improve their relationships. Although they are not confident that the orthodontist is so eager to participate in efforts toward such improvement, they will welcome all sincere overtures. There is apparent confusion as to practice and procedure. A study of this nature can best serve as a preliminary step toward the formulation of a program of study of the possibilities for improvement of the coordination of the functions of the dentist and the orthodontist.

PROFESSIONAL BUILDING.

CASE REPORT OF TOOTH SUBSTANCE COMPLETELY DEVELOPED ABOUT A FOREIGN BODY

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THIS case on which I wish to report first came to my attention on June 10, 1932. The preliminary examination revealed a normal mesiodistal relationship of the molars and an alignment of the anterior teeth that was quite pleasing to the eye. The lower second premolars, however, were impacted, the one on the right attempting to erupt lingually because of insufficient room. The left second premolar could not be located by visual or digital examination. Extraoral radiographs were then taken and revealed a very deep impaction which undoubtedly had been partially caused by the placing of a heavy silver wire to reduce a fracture of the mandible.

History.—At the age of 7, this patient had been kicked by a mule with the result that the mandible had been fractured in two places, between the lower left lateral incisor and canine, and between the crowns of the forming premolars. To hold the fragments together, the mandible had been wired with silver wire, 0.050 inch in diameter.

Recovery from the fracture had been uneventful. When the patient was 15, however, he was brought to our office, as his parents were concerned about the failure of the normal eruption of the lower second premolars (Figs. 1, 2, 3, and 4).

Radiographic Examination.—The extraoral radiographs taken at this first appointment apparently showed the wire passing through the root of the lower left second premolar (Fig. 5), so several small intraoral pictures were taken at different angles to verify this observation. All of the pictures seemed to indicate that the wire did pass through the root except the occlusal x-rays, which views left some doubt in my mind as to this possibility (Fig. 6).

Treatment.—Because of the fact that the patient lived some eighty miles from Cleveland, and because the removal of the wire would necessitate a rather severe operation, it was decided to treat the case under the premise that the root of the tooth had developed in such a manner as to form a hook under the wire and thus prevent the tooth's eruption. A survey of past dental literature revealed no records of tooth structure developing about a foreign body. Dr. Samuel Chase, of Western Reserve Medical School, Department of Histology, did, however, know of an elephant skull which showed a flint spearhead embedded in one of its tusks at a point some distance from the skull, and it was believed that this spear had penetrated the formative organ of the tusk early in the life of the elephant and had moved to its final position by growth of the tusk.

After considerable thought it was decided to treat the case as if it was one of usual impaction, and appliances were constructed to make space for the impacted premolars.

In the lower arch the first molars were banded and fitted with 0.036 inch buccal tubes and half-round lingual tubes, and the canines were also banded. Lingual appliances were constructed with auxiliary springs to work the lower first premolars mesially. A horizontal arch, fitted with coiled springs and ligated to the lower incisors, and attachments constructed for root movement and rotation of the lower canines were constructed to work the incisors and canines anteriorly.

Fig. 1. Fig. 2.

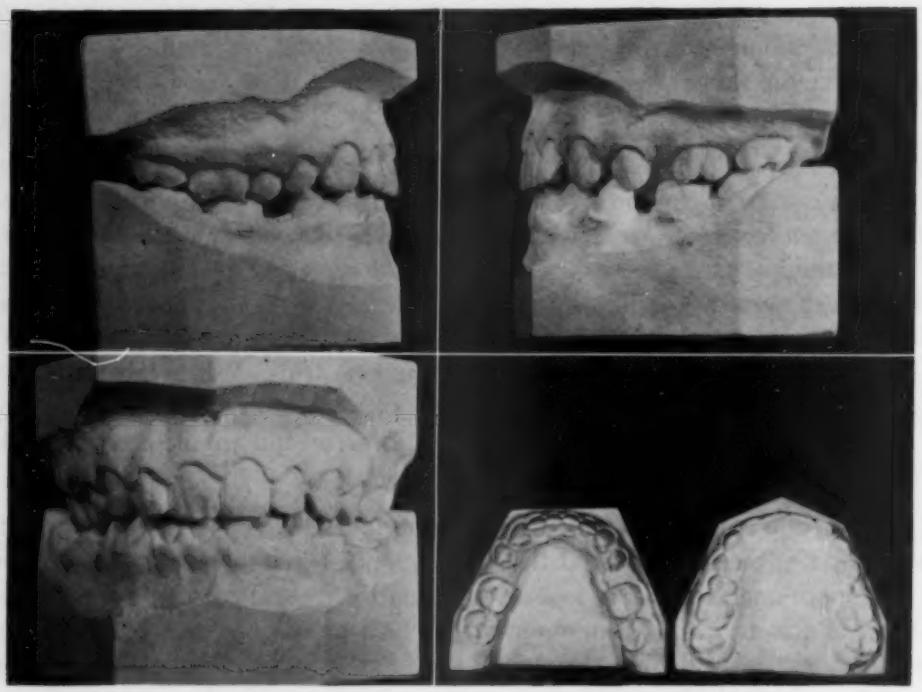


Fig. 3. Fig. 4.

In the upper arch the first molars were banded and fitted with buccal 0.036 inch round tubes and lingual half-round tubes. An 0.036 inch horizontal arch was constructed with a coil spring on the left, the compression of which, by ligation to the upper anterior teeth, was to work the molar distally as well as the anterior teeth forward, creating the necessary space for the crowded left second premolar. The canines were banded and fit with a high labial extension at the end of which was soldered a 0.020 inch tube. Coiled 0.014 inch chrome-steel spring wire coiled about the horizontal wire just distal to the canines and then passing up through these 0.020 inch tubes afforded very delicate anterior root movement. This same attachment was used on the lower canines for anterior root movement and for rotation of the left lower canine.

These appliances were cemented on Aug. 26, 1932, and on Dec. 3, 1932, because of the overbite, a skeletal type bite plane was constructed to the labial arch to open the bite, thus allowing the lower anterior teeth to be worked forward with less interference from the inclined planes of the upper anterior teeth.

Fig. 5.

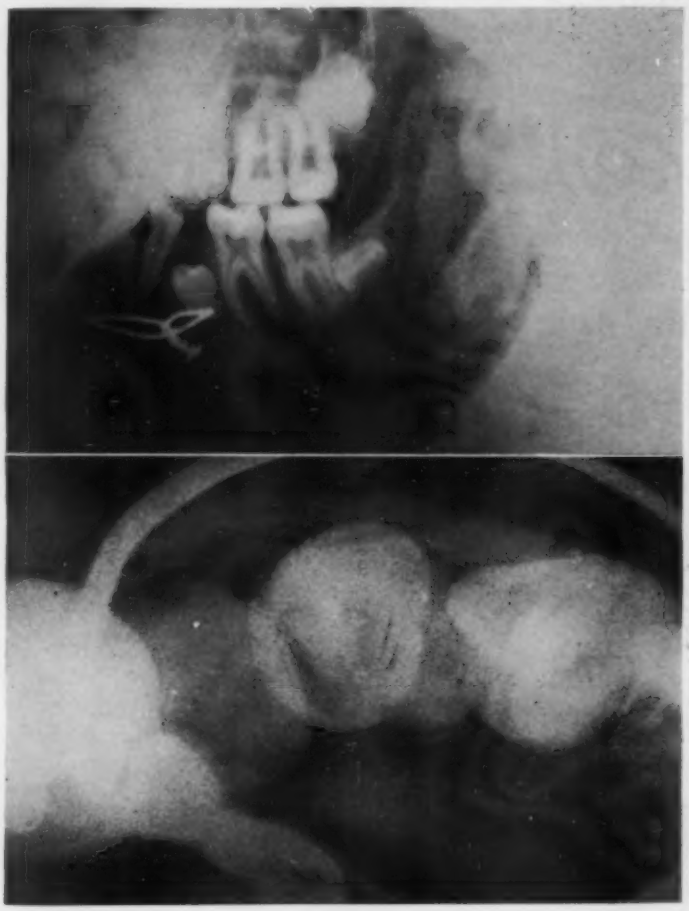


Fig. 6.

From May 5, 1933, until June 5, 1934, the space was held open for the left lower second premolar to erupt, and three series of x-rays taken during this time proved that the tooth would not erupt of its own accord. (Fig. 7.) On June 5, 1934, the oral surgeon exposed the crown of the impacted tooth and a new lower lingual arch was placed with an iodosyl pack seated over the wound to allow for healing of the soft tissues in such a manner as to keep the occlusal portion of the tooth uncovered. On June 15, 1934, a small inlay about 0.040 inch in diameter with a loop in it was cemented in the occlusal pit, and by means of a very delicate spring pressure afforded by coiling an 0.014 inch chrome-steel spring wire several times about the lingual arch and fastened to

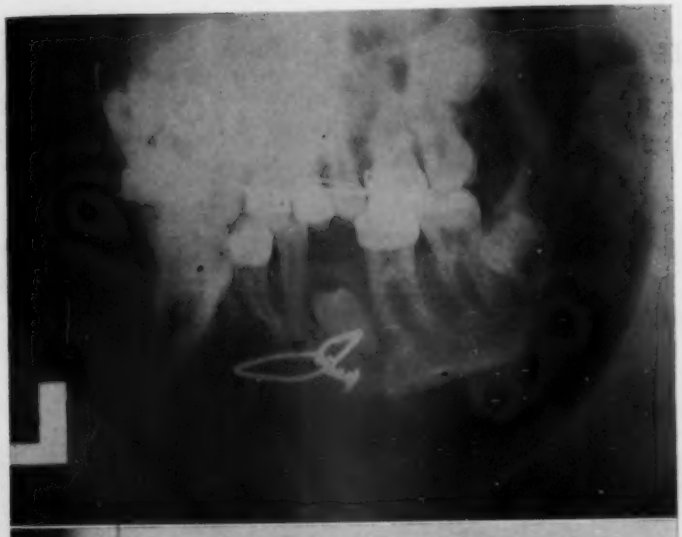


Fig. 7.

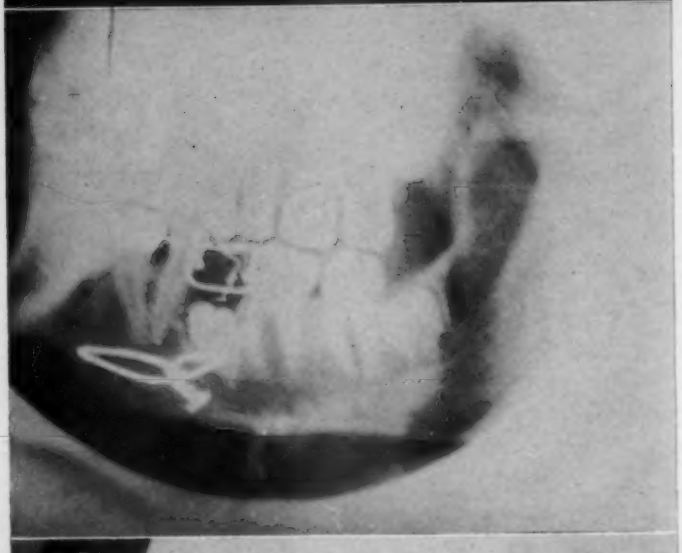


Fig. 8.

Fig. 9.

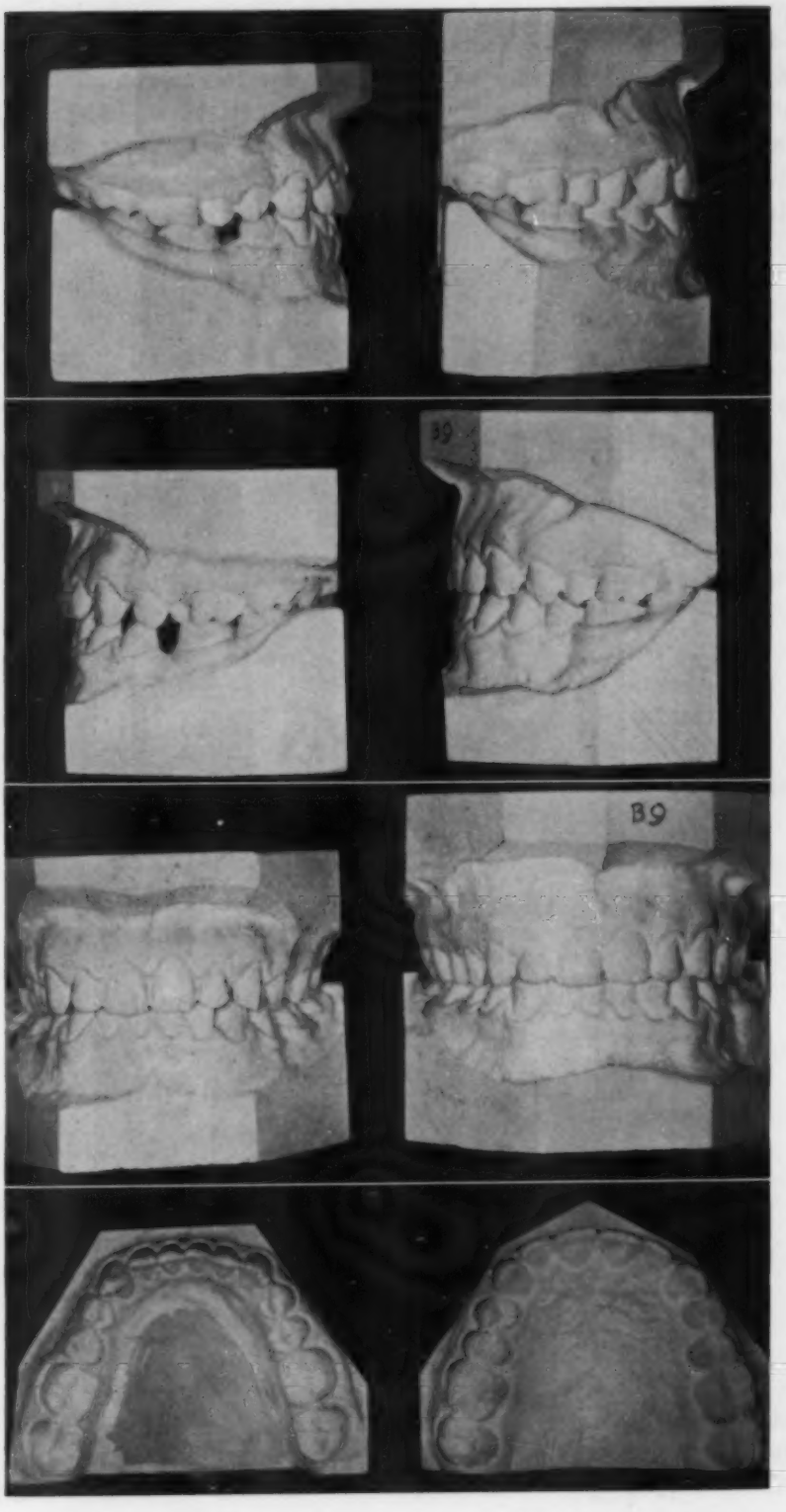


Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.

the loop on the inlay, a vertical eruptive pressure was created (Fig. 8). Because I felt that the root was hooked about the wire, I applied pressures which I felt would release the tooth. By April 9, 1935, after the left lower canine and molar abutment teeth showed decided signs of being depressed, I was convinced that the wire passed through the tooth and an operation to remove the wire would be necessary. Three more series of x-rays were taken, however, before consenting to the operation.

Fig. 14.

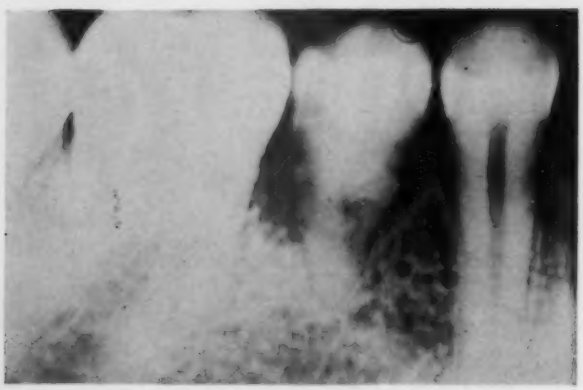


Fig. 15.

On June 10, 1935, the patient was hospitalized, and on the following day the oral surgeon operated under general anesthesia. The incision was made through the original scar and the wire was removed from the lingual aspect of the mandible (Fig. 9). The silver wire seemed to have crystallized and broke into several pieces while being removed. On June 28, 1935, the mandibular

appliance was replaced and the eruptive pressure continued; by Nov. 22, 1935, the tooth had erupted sufficiently to contact the upper antagonists and allowed for the placing of a band for the necessary rotation, which was accomplished by the use of a Case rotater. This rotation was completed by Feb. 24, 1936, at which time its retention was made certain by ligating to the left mandibular molar band and the mandibular lingual wire was removed.

The upper appliance had been removed on Aug. 29, 1934, but was replaced on Jan. 13, 1936, to align the anterior teeth better, and all appliances were removed on Sept. 10, 1936.

About six weeks later, maxillary and mandibular record casts were taken, and, at this time, I tested the vitality of the tooth by applications of heat and got slight response (Figs. 10, 11, 12, and 13).

On April 1, 1940, three and one-half years after all appliances were removed, photographs were taken in which you will note the final retention of the side involved (Fig. 14). The x-rays taken at this time showed satisfactory bone development about the root of the lower second premolar (Fig 15).

On Dec. 6, 1941, I received a report and an x-ray from the Navy dentist stationed at the Naval Reserve Air Base at New Orleans, at which the patient was then stationed. An electric pulp tester showed the tooth to be definitely vital.

In attempting to determine the position of the wire with regard to the root of the tooth, as well as to record steps of progress, 28 small intraoral x-rays and 5 extraoral x-rays were taken.

I believe this case proves beyond a doubt that tooth structure can grow about a foreign body.

I would like to give credit to Dr. Edward Reiter who performed the surgery in this case.

KEITH BUILDING.

CEPHALOMETRIC APPRAISAL OF A TREATED MANDIBULAR DISPLACEMENT CASE IN AN ADULT PATIENT

JAMES W. FORD, D.D.S., AND WILLIAM F. FORD, D.D.S., M.S.D., CHICAGO, ILL.

THE patient, R. S., was a 42-year-old white woman. She complained of extreme arthritic-like pain in the condylar region with limited movement of the condyles during opening, closing, and masticatory movements of the jaw. A diagnosis of overclosure and posterior mandibular displacement caused by lingual version of the upper four incisor teeth was made. This woman was an intelligent high school teacher and presented a rather average history of health from infancy throughout adulthood except for a case of rheumatic fever at the age of 20.

The onset of the arthritic-like pain in the condylar and neck regions started within one week after gold inlays were placed in the maxillary and mandibular first permanent molars. Her dentist then attempted to adjust the occlusion by grinding down the occlusal surfaces of these teeth.. Temporary relief followed, but occlusal interference developed on the left side of the arch. More grinding ensued, followed by temporary relief, until over a period of a year the occlusal surfaces of all the teeth had had some spot grinding in attempting to achieve a balanced articulation.

The symptoms of pain grew increasingly worse until the patient was under the almost constant vigil of the physician or the dentist.

To quote Dr. Sicher, "The symptoms of mandibular overclosure start with a breakdown of muscle balance, followed by loss of normal relations between condyle and disk and by impairment of the forward sliding movement of the condyle and the disk on the articular tubercle. The results are destruction of the disk and degenerative and proliferative changes on the condyle and tubercle under the well defined picture of deforming arthritis of traumatic origin. The local and irradiating pain, cracking of the joint and restriction of movements of the joint are simply symptoms of arthritis."

Sedatives were taken quite freely and a round-shouldered condition developed due to the constant overfatiguing of the neck and facial musculature. As is quite often the case in patients having a condition of organic origin, the psychological problems that follow are often more grave than the original condition. At this particular point the orthodontist was consulted.

A functional analysis of the patient's occlusion based on the concept that the position of the mandible is established primarily by the musculature revealed that there was an abnormal path of closure from rest position to occlusion, resulting in an overclosure and a posterior displacement of the condyles

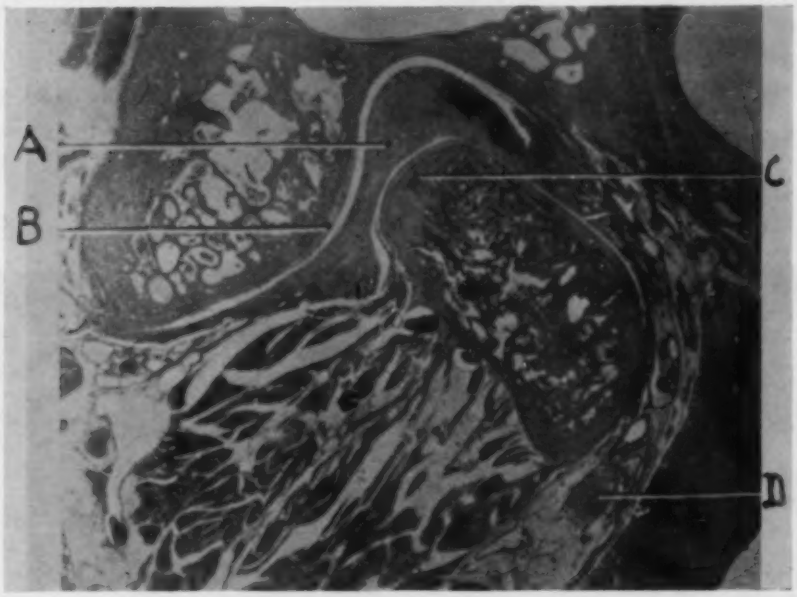


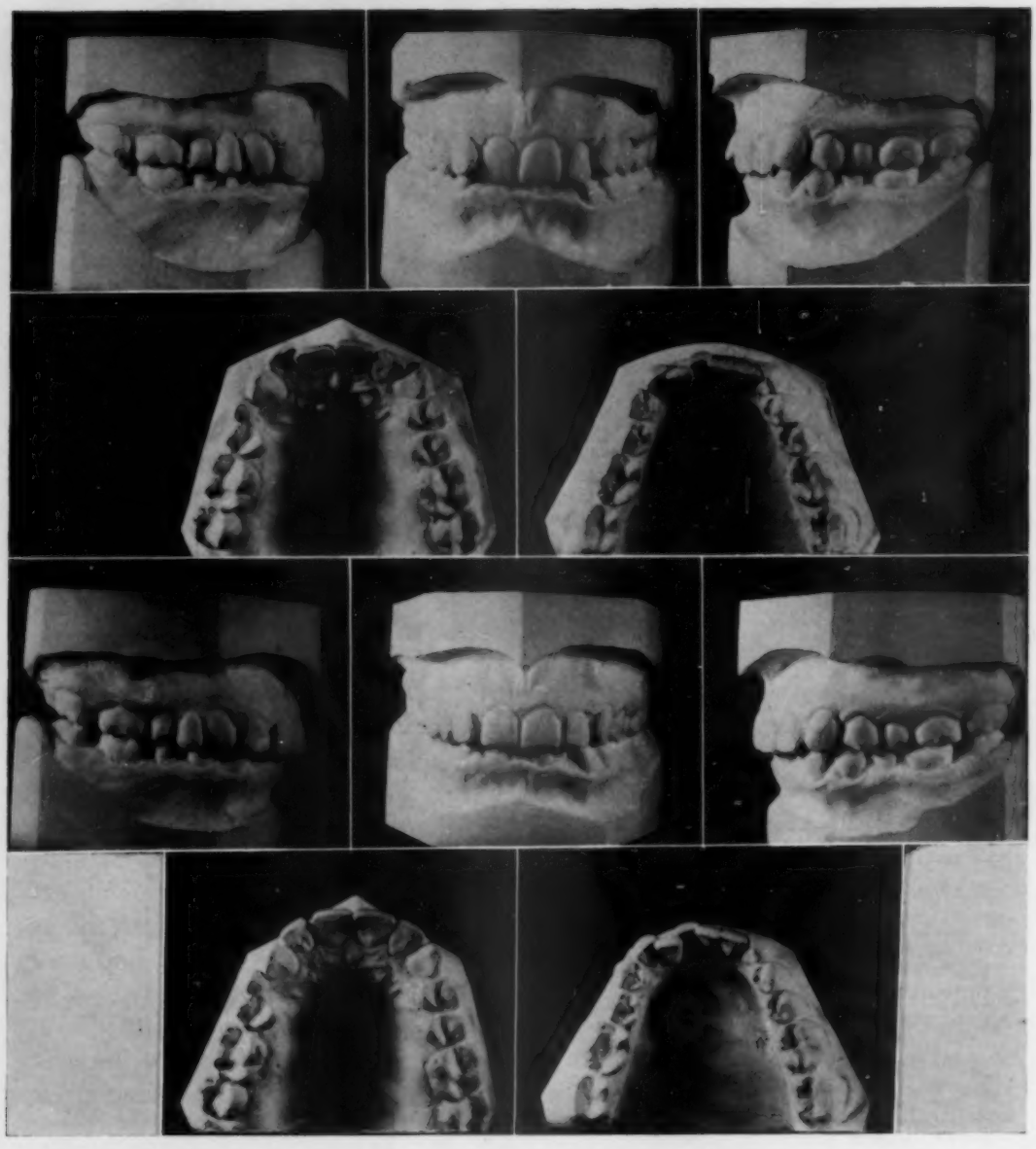
Fig. 1.—Sagittal section through normal temporomandibular articulation of man, aged 28. *A*, Articular disk; *B*, articular tubercle, posterior slope; *C*, condyle; *D*, auriculotemporal nerve. (From S. W. Chase, Western Reserve University; courtesy of Sicher, Harry: J. Am. Dent. A. 36: 131-139, 1948.)

TABLE I. CEPHALOMETRIC ANALYSIS*

PLANES AND LANDMARKS IN SKELETAL ANALYSIS		MEAN (FOR ADULTS)	STANDARD DEVIATION	PATIENT M.R.S.		
Relative anteroposterior position of maxilla	or S-N-A	82.01°	3.89°	85°		
Relative anteroposterior position of mandible	or S-N-B	79.97°	3.60°	81°		
Relative anteroposterior position of maxilla to mandible	difference of or S-N-A to S-N-B	2.04°		3.07°		
Angle formed by mandibular plane and the constant sella nasion plane	or NS-GoGn	31.71°	5.19°	34°		
Angle of convexity	or N-A-P	-1.62°	4.78°	-3.88°		
DENTURE ANALYSIS				BEFORE TREATMENT	AFTER TREATMENT	CHANGE
Axial inclination of upper central incisors to nasion sella	or $\underline{\lvert 1}$-NS	103.97°	5.75°	85°	99°	14°
Axial inclination of upper central incisors to lower central incisors	or $\underline{\lvert 1}$-$\overline{\lvert 1}$	130.98°	9.24°	154°	131°	23°
Axial inclination of lower incisors to mandibular plane	or $\overline{\lvert 1}$-GoGN	93.09°	6.78°	82.5°	85°	2.5°
Relationship of upper central incisors to line drawn from nasion to pogonion (measured in mm. from incisor edge)	or $\underline{\lvert 1}$-NP	5.51 mm.	3.15 mm.	3.9 mm.	6.9 mm.	3 mm.

*From Downs, Mayne, and Toothaker.

A.



B.

Fig. 2.—Models of patient (*A*) before treatment, and (*B*) after treatment. The length of active treatment was five months. No attempt was made to correct the alignment of the mandibular teeth.

of the mandible in the fossae. The mechanical interference causing the displacement was due to the lingual inclination of the upper four incisors (85° as compared to a mean for adults of 103.57° with a standard deviation of 5.75°).

This analysis is divided into two parts, skeletal and denture. There is nothing the orthodontist can do in his treatment to alter the skeletal pattern, but, in diagnosis and treatment planning, this analysis is an aid in determining just what particular type of growth and skeletal pattern is involved and the relationship of the denture to this pattern.

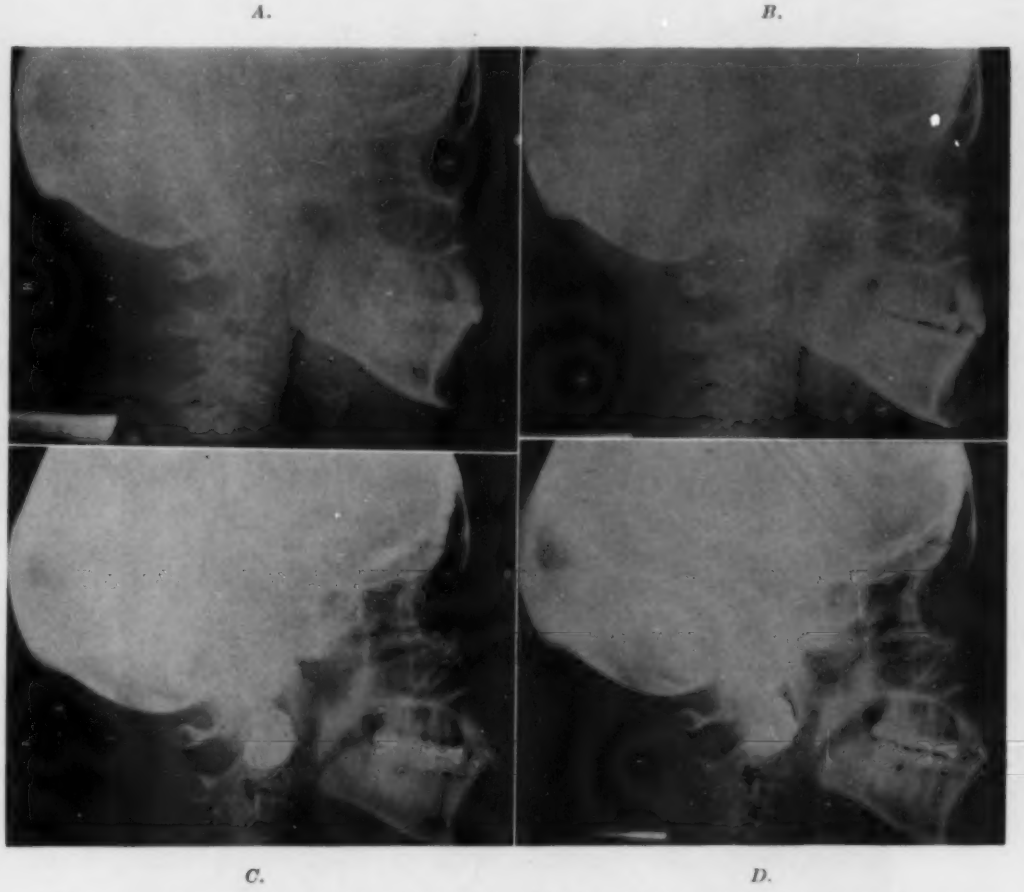
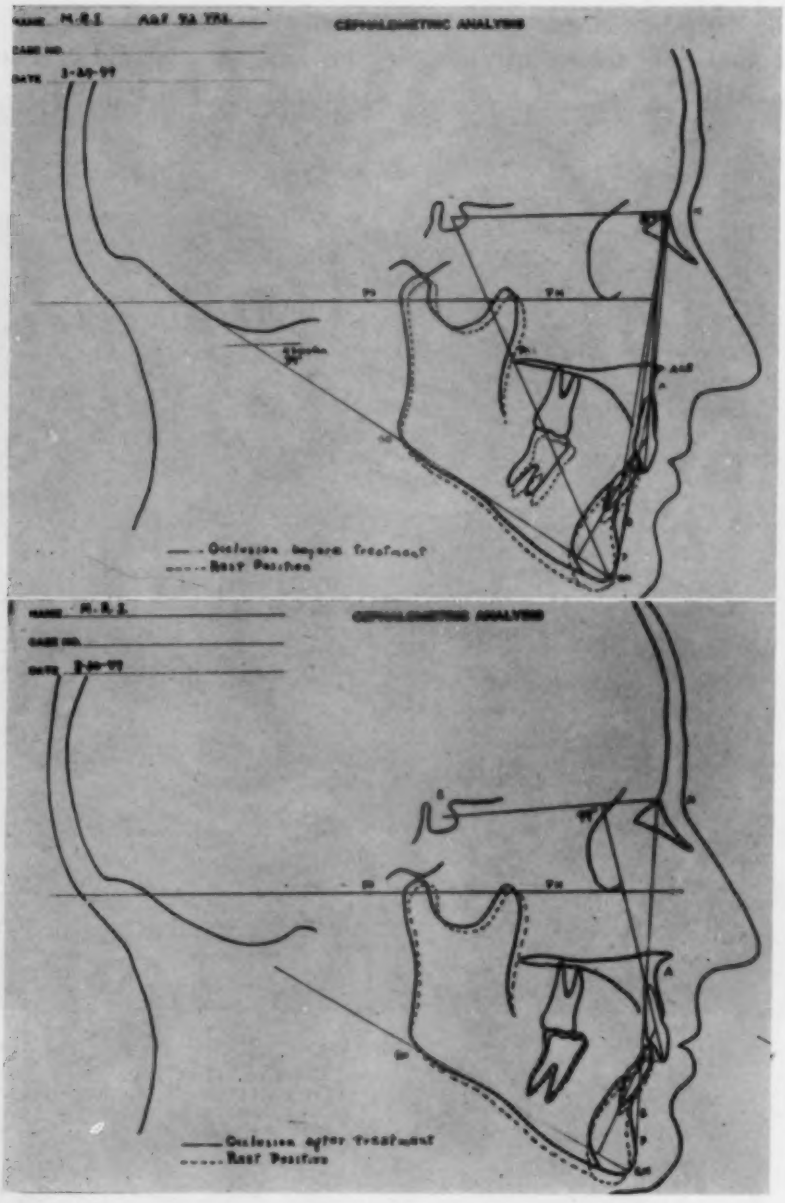


Fig. 3.—Oriented lateral cephalometric roentgenograms of patient. *A*, Before treatment (with teeth in occlusion); *B*, before treatment (with mandible in its physiologic rest position); *C*, after treatment (with teeth in occlusion); *D*, after treatment (with mandible in its physiologic rest position).

In the denture analysis, however, certain significant orthodontic changes of the dental units in the alveolar bone may be measured and recorded. These readings taken before, after, or during treatment are compared to one another to determine the amount of change that has occurred and to ascertain whether or not they fall within the normal ranges (mean) for that particular age group.

These angles and ranges constitute a relative basis or language through which the average normal cases and cases of malocclusion can be compared to one another and are by no means to be interpreted as a positively fixed standard.

A.



B.

Fig. 4.—Tracings of Fig. 3. *A*, Before treatment; *B*, after treatment. Note the position of the head of the condyle in *A* with teeth in occlusion as compared to *B* with teeth in occlusion after the mechanical interference causing the posterior displacement was corrected.

The plan of treatment was divided into three phases as follows:

1. Immediate insertion of a bite plate to prevent further overclosure and condylar irritation.

2. Lengthening of the upper arch in the anterior segment with the establishment of normal arch form and a normal path of closure.

3. Retainer with bite plate to establish correct vertical dimension.

The first stage of treatment produced only temporary relief. Because of the pain following removal of the bite plate, the patient was reluctant to be without it, even while eating.

Fig. 5.

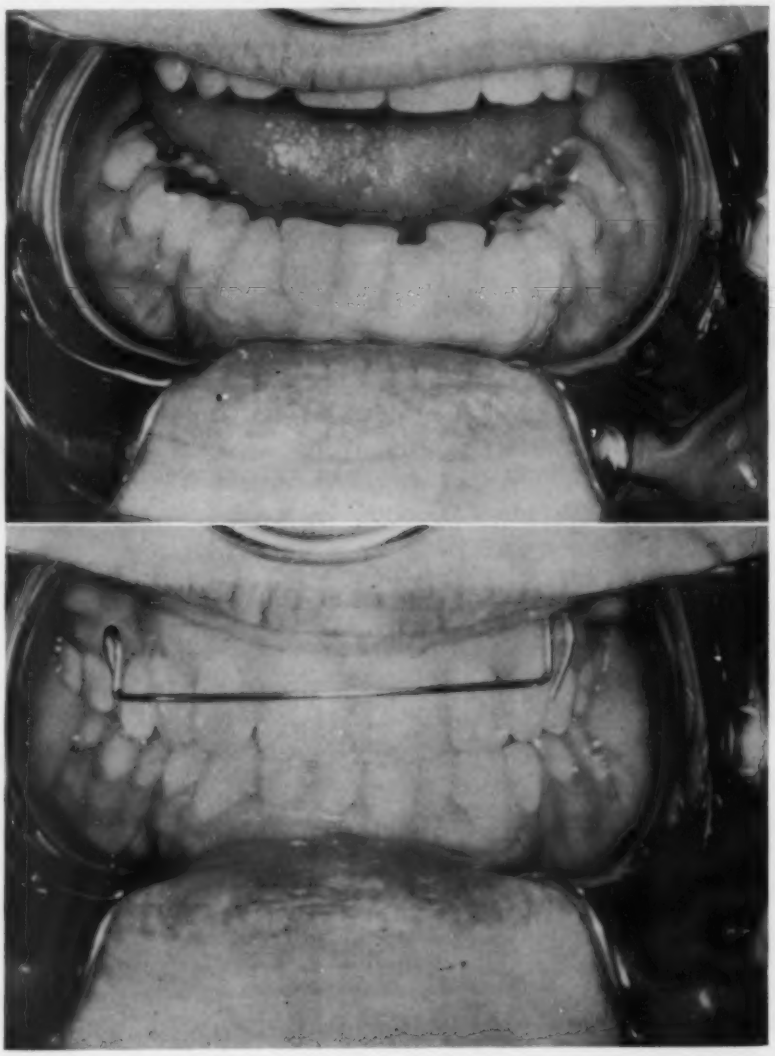


Fig. 6.

Fig. 5.—Mandibular view of patient showing extreme attrition of incisor teeth, which is usually one of the main diagnosis symptoms of posterior displacement cases.

Fig. 6.—The retainer was inserted after the interference was eliminated by moving the maxillary incisors labially and establishing a normal path of closure. The bite plate served to correct the vertical relationship of the arches.

During the second stage of treatment when the anterior teeth were moved labially and the correct path of closure was attained, the patient, without the aid of the bite plate, experienced complete relief from pain for the first time in fourteen months. Pain disappeared; normal eating habits returned with marked increase in vitality and posture.

The successful conclusion of this case can be attributed to the fact that the correct diagnosis was established by a functional analysis of the occlusion of the teeth rather than by merely an analysis of the static relationship of the dental arches.

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55 E. WASHINGTON STREET.

Editorial

George Wellington Grieve

The death of Dr. George Wellington Grieve of Toronto, Ontario, Canada, again calls to mind the energy, devotion, and enthusiasm which some of the pioneers of the specialty of orthodontics put into their lifework. Dr. Grieve was a worker, an enthusiast, a precision workman, devoted to his calling.

Dr. Grieve was one of the first to be convinced that there are some cases in which a full complement of teeth is not possible to retain and at the same time bring about a creditable correction of malocclusion. Having reached this conclusion he courageously defended this contention during a period of orthodontic history when it required not only courage, but also even risk of reputation to defend such a position.

Dr. Grieve was a man of strong convictions but his ideas that he so eagerly defended were always based upon deep study and thorough analysis of the subject in hand.

He was inspired to study orthodontics, as were so many others of his day, by Dr. Edward H. Angle when the latter presented a paper before the Provincial Dental Society in Canada during 1907. He later became a student of Dr. Angle in St. Louis, Missouri, and stated that much of his later inspiration in orthodontics came from other men of his type: J. Lowe Young, Herbert Pullen, and Albert Ketcham.

From about the year 1920, he became a liberal contributor to orthodontic programs, and he left a voluminous printed record to orthodontic literature.

He read papers before almost all of the orthodontic organizations of this country from coast to coast and several in Europe. One of his papers entitled "Some Theories Obstructing Progress of the Science of Orthodontia" was read before the European Orthodontological Society at Zürich in 1930, and in 1931 he read a paper before the International Orthodontic Congress in London.

Dr. Grieve, or "Scotty" as he was affectionately called by his intimate friends, received the honorary Ketcham Award in 1940 at the regular annual session of the American Association of Orthodontists in Chicago.

This highest award possible in orthodontics was conferred for outstanding contributions to the advancement of orthodontics as a specialty in dentistry. In making the award, Dr. Harry Kelsey, President of the American Board of Orthodontics, pointed to Dr. Grieve's high moral and ethical standards and his unquestionable ability and notable achievements.

Orthodontics has lost one of its bulwarks of strength and courage and the dean of orthodontics in Canada.

Dr. Grieve made such an important imprint upon the history of orthodontics that the readers of the AMERICAN JOURNAL OF ORTHODONTICS will no doubt be interested in a list of his contributions which follow herewith.

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In Memoriam

GEORGE WELLINGTON GRIEVE

1870-1950

GEORGE WELLINGTON GRIEVE was born at Cobourg, Ontario, Canada, on Sept. 18, 1870. Both of his parents died while he was quite young and he was placed in care of relatives on a farm near by. His early education was of a somewhat sketchy nature, consisting of chores on the farm and short terms at school a mile or more away. At the age of 13 he decided to seek wider fields and left the farm for work in town as a printer's helper, at a wage of $1.50 per week. He continued to work in printing and newspaper offices for several years in Montreal and Toronto, and added to his education by attending night school, preparatory to entering the Royal College of Dental Surgeons in 1896, from which he graduated in 1899. He soon became interested in orthodontics and, having fallen under the spell of Dr. Edward H. Angle, decided to attend the Angle School in St. Louis in 1907. Returning to Toronto he set himself up in the exclusive practice of orthodontics.

Dr. Grieve had an inquiring mind, and he soon began to question some of his early teachings; after witnessing the disappointing relapse of some earlier treated cases, he came to the conclusion that a full complement of teeth was not always possible for successful retention. Having made his decision he courageously defended his theories on all occasions, until finally they came to be generally accepted.

He was called upon frequently to prepare papers for orthodontic meetings, and appeared on the program of the First International Orthodontic Congress in New York City, the Second International Orthodontic Congress in London, England, the European Orthodontological Society in Zürich, as well as the American Association of Orthodontists many times. He held honorary life membership in the Academy of Dentistry in Toronto, of which he was a past president, and also honorary life membership in the Ontario Dental Association. He was a member of the Canadian Dental Association, the American Association of Orthodontists, and the Great Lakes Society of Orthodontists. He was the recipient of the Ketcham Award from the American Board of Orthodontics in 1940 for his outstanding contributions to his beloved profession.

Dr. Grieve was precise as to detail in everything he did and constantly endeavored to reach the ideal. His integrity and basic honesty were such that he would brook no compromise with what he believed to be the truth. Though he achieved a position of prominence, he remained a modest and sincere

gentleman, and gave generously of his time and talents to help any younger man who sought his advice. In earlier years he was an enthusiastic golfer and bowler and an ardent fisherman. These were his relaxations, but throughout his lifetime his greatest urge was the furtherance of orthodontic ideals.

The life of George Grieve was one of accomplishment, achieved by a thirst for knowledge and a capacity to apply that knowledge carefully.

To Mrs. Grieve, who survives, goes the heartfelt sympathy of a host of friends, and the consolation of a memory for one who will remain an inspiration for all whose privilege it was to know him.

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Edited by
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Direction and Type of the Transverse Palatine Suture and Its Relation to the Form of the Hard Palate: By Ju-Kang Woo. *Am. J. Phys. Anthropol.* 7: (N.S.) 385-399, September, 1949.

The hard palate is composed of the palatine processes of the maxillae and the horizontal parts of the palate bones. The former articulate posteriorly with the latter at the transverse palatine sutures. These sutures show a number of variations in their course. Sutures which curve backward were first noted by Meckel (1815). Topinard (1885) first described the form which curves forward, and Gegenbaur (1898) reported the straight course of the sutures. Extreme cases of sutures that curve backward as far as the posterior margin of the hard palate, so that the palatine processes of the maxillae constitute the posterior nasal spine, were described by Henle (1871), Hyrtl (1884), and Waldeyer (1892). It was Stieda (1894) who first classified the different directions of the suture into three forms as transverse, forward, and backward, and gave statistical data for each kind. He named the combination of any two of the three forms the "irregular" form. Matiegka (1900) further divided the irregular form into three kinds and Le Double (1906) made more minute divisions of the suture into seven varieties.

Racial differences in the direction of the suture have been searched for by Stieda (1894) and Killerman (1894). However, owing to the small number of specimens examined, no definite conclusion was reached by either author.

Various suggestions have been made to explain the different directions of the transverse palatine sutures. Stieda (1894) offered the explanation that the direction of the sutures was determined by two ossification centers appearing between the posterior border of the palatine processes of the maxillae and the anterior border of the horizontal parts of the palate bones and fusing either with the former or the latter. This idea may be attributed to Calori's finding of the mediopalatine bones (1868), which are a pair of small bones found in rare cases between the palatine processes of the maxillae and the horizontal parts of the palate bones (Woo, 1948a). Killerman (1894) believed that the transverse and posterior directions are related to the brachystaphyline and the anterior direction to the leptostaphyline. In discussing the explanation of Stieda, Augier (1931) stated that the direction of the sutures is determined mainly by the horizontal parts of the palate bones. He holds that the anterior direction of the suture always indicates a hyperdevelopment of the horizontal parts of the palate bones at the cost of the palatine processes of the maxillae; that the transverse direction indicates more often a hypodevelopment but sometimes a hyperdevelopment of the horizontal parts of the palate bones; and that the posterior direction of the suture always indicates a hypodevelopment of the same parts of these bones.

It is generally considered that the transverse palatine suture belongs to the type of *serrate suture*. In textbooks of gross anatomy (Cunningham, 1943; Gray, 1948; Morris, 1946; and Piersol, 1936), the relation of the two parts forming the suture is described as serrately articulated, i.e., the two parts have saw-toothed interlocking processes. However, Woo (1948b) has shown recently that it is a type of *squamous suture*.

MATERIAL AND METHOD

The hard palates of 1,531 adult skulls of American whites and Negroes in in the Terry Anatomical Collection of Washington University were studied. Three other series (Eskimo, 189 males and 164 females; American Indian, 94 males and 77 females; and Mongolian, 91 males and 67 females) were observed in the United States National Museum during the summer of 1948. The direction of the suture is classified according to its course on the oral or inferior surface under four categories: anterior, posterior, transverse, and irregular. The anterior direction is that in which the sutures on both sides curve generally forward and the posterior one, generally backward. The transverse direction refers to sutures having their courses approximately at right angles to the median palatine suture. When the direction of the sutures on the two sides is different or the suture is irregular in itself, it falls into the irregular category.

The hard palates of 319 sagitally sectioned skulls among the American white and Negro series were studied to determine the type of the transverse palatine sutures. Of the 319 skulls, both the right and left halves were suitable for observation in 42 skulls. In the remaining 277 skulls, as they had been sectioned either a little to the right or left of the midline in order to preserve the nasal septum intact, one side only was observed. In addition, the hard palates of 64 embryos and fetuses ranging in age from 6 weeks to full term were examined. The fetal skulls had been cleared with KOH and stained with alizarin red.

The suture line on the oral or inferior surface of the hard palate can be seen on the nasal or superior surface by holding the half skull before a strong light and may be traced on the superior surface with the sharp point of a pencil. Thus, a line can be made on the superior surface of the hard palate corresponding to the position of the transverse palatine suture on the inferior surface. The extent of overlapping by the two bones was made possible for measurement with a sliding caliper, and measurement of the greatest extent of overlapping was taken in the 319 adult skulls. The development of overlapping in different gestation periods of embryos and fetuses from 6 weeks on to full term was noted.

The size of the hard palate was ascertained with a sliding caliper according to its length and breadth. The length was taken between the midpoint of a line tangent to the posterior alveolar border of the median incisors and the midpoint of a transverse line connecting the most anterior points of the notches in the posterior border of the palate. The breadth was taken between the internal alveolar borders at the second molar teeth.

RESULTS AND DISCUSSION

Degree of Overlapping.—From observation of the 319 adult skulls which had been sagittally sectioned, and on which the suture lines of both the oral and nasal surfaces were clearly seen, it appears that the palatine processes of the maxillae and the horizontal parts of the palate bones overlap instead of being serrately articulated. The palatine process of the maxilla and the horizontal part of the palate bone overlap in the extent of their bevelled edges with the maxillary portion in the inferior position. The greatest extent of overlapping in each adult skull was measured. The extent of overlapping is usually greatest

in the lateral portion of the suture and was found to range from a slight degree to 8 mm. The females in both series have a slightly greater extent of overlapping than do the males, and the extent of overlapping in American whites is slightly less than in American Negroes. However, these differences are not statistically significant.

Of the 64 embryos and fetuses studied, 49 were of more than ten weeks' gestation and all show the overlapping condition. It is in the tenth week (CR 45 mm.) that the overlapped condition begins to appear.

The overlapped condition is also present in all of the 14 skulls of apes and monkeys and in the one dog skull examined.

Thus, the articulation of the transverse palatine suture belongs to the type of *squamous suture* instead of *serrate suture*, as is generally described. This seems to be true at least for primates and possibly for all mammals.

Direction of Transverse Suture.—The corresponding directions in the two sexes in all the 5 series studied are quite similar in percentages. However, percentages of the anterior direction of the suture in the male are higher than in the female in all the 5 groups, though the differences are not statistically significant. There seems to be no true sexual difference in direction of the transverse palatine suture. In general, the anterior direction of the transverse palatine sutures is most frequent, and the irregular form the least. The American Negro series has the highest percentage of anteriorly directed sutures and the lowest percentages of transversely and posteriorly directed sutures. The American white series of the present study shows a similar result to the East Prussian series of Stieda (1894). The percentage of the anteriorly directed sutures is smaller and percentages of the transversely and posteriorly directed ones are greater in the American Negro series than in the American white series. Mongolians, Eskimos, and American Indians all have lower percentages of the anterior direction and higher percentages of the transverse and posterior directions than do other groups. Melanesians have the lowest percentage of the anterior direction and the highest percentage of the transverse direction.

Relation of Palatal Form to Suture Direction.—The males in all series have greater absolute size than do the females, whereas the index of the palate of the males is smaller than that of the females, with the exception of the American Indian series in which the males have greater relative breadth of the palate, perhaps due to the small number of cases. The American Negroes have the greatest mean palatal length, and the American Indians the greatest mean palatal breadth. It is interesting to note that values of the mean palatal indices in the different series increase in the order that the percentages of the anterior directions of the different series decrease. Thus, the American Negro series has the smallest mean palatal index and the greatest percentage of the anteriorly directed transverse palatine sutures, whereas the Mongolian series has the greatest mean palatal index and the smallest percentage of the anteriorly directed transverse palatine sutures.

It is also of interest to note that the females in all series have higher mean palatal indices than do the males except in the American Indians. As mentioned previously, the males in all the 5 series have higher percentages of the anteriorly directed transverse palatine sutures than do the females. This may be interpreted to indicate that the direction of the transverse palatine suture is related to the breadth of the hard palate. It is clearly seen that in both series the anteriorly directed sutures decrease in percentage whereas the transversely and posteriorly directed sutures increase as the palatal indices increase. The curves of the transversely and posteriorly directed sutures gradually rise as the palatal indices increase, though the latter increases more slowly than the former. On

the other hand, the curve of the anteriorly directed transverse palatine sutures drops as the palatal indices increase. Though the distributions of the percentages of the different directions of the suture differ somewhat in the American white and Negro series, they show the same trends. Thus, the directions of the transverse palatine sutures are related to the relative breadth of the hard palate. The narrow palates have a higher percentage of the anteriorly directed sutures and lower percentages of the transversely and posteriorly directed ones.

In conclusion, as the palatine processes of the maxillae and the horizontal parts of the palate bones overlap in the extent of their bevelled edges with the maxillary portions in the inferior position, the directions of the transverse palatine sutures as seen on the oral or inferior surface of the hard palate are expressions of the extent of the palatine processes of the maxillae, instead of the palate bones as suggested by Augier (1931), and in turn they are related to the relative breadth of the hard palate.

Hard palates of 2,214 skulls in 5 different racial groups and of 64 embryos and fetuses ranging in age from 6 weeks to full term were studied.

The palatine processes of the maxillae and the horizontal parts of the palate bones overlap in the extent of their bevelled edges with the maxillary portions in the inferior position. Thus, the articulation belongs to the type of *squamous suture* instead of *serrate suture.*

The parts of the two bones forming the suture begin to overlap at the age of 10 weeks in the embryo.

The anteriorly directed transverse palatine suture is most frequent, the irregular form, the least.

The males in all series have higher percentages of the anteriorly directed sutures than do the females, though the differences are not statistically significant.

The American Negro series has the highest percentage of the anteriorly directed sutures and the lowest percentages of the transversely and posteriorly directed ones. The American white series has a lower percentage of the anteriorly directed and higher percentages of the transversely and posteriorly directed sutures than does the American Negro series. Mongolians, Eskimos, and American Indians all have lower percentages of the anteriorly directed and higher percentages of the transversely and posteriorly directed sutures than do the other two series.

The males in all series have a greater absolute size of the hard palate than do the females, whereas the index of the palate of the males is smaller than that of the females.

American Negroes have the greatest mean palatal length, and American Indians the greatest mean palatal breadth.

The direction of the transverse palatine suture as seen on the oral surface of the hard palate is an expression of the extent of the palatine process of the maxilla and is related to the relative breadth of the hard palate. Narrow palates have a higher percentage of the anteriorly directed and lower percentages of the transversely and posteriorly directed transverse palatine sutures than do broad palates.

News and Notes

Preliminary Program of Meeting of the American Association of Orthodontists, Edgewater Beach Hotel, Chicago, May 8 to 11, 1950

Monday, May 8

1:30 to 5:30 Program to be presented under direction of the Research Committee. (Details later.)

7:00 Stag dinner and entertainment.

Tuesday, May 9

9:15 Address of Welcome. Mayor Martin Kennelly.
Response. Joseph E. Johnson.

9:30 President's Address. Max E. Ernst.

9:45 European Orthodontics. Howard E. Strange.

10:15 Simplicity in Orthodontic Concept and Treatment. Andrew F. Jackson.

11:15 The Place of Orthodontics in the Complete Rehabilitation Program for Those Possessing Congenital Facial Clefts. Wayne B. Slaughter.

12:15 International Luncheon.

2:00 to 5:00 General Clinics.

Wednesday, May 10

9:15 Function of the Tongue in Developing Normal Occlusion. D. Robert Swinehart.

10:00 A Restatement of the Myofunctional Concept in Orthodontics. Alfred P. Rogers.

11:00 Anatomy and Physiology of Head and Neck Musculature. Allan G. Brodie.

2:00 Heredity, Growth, and Observation as Related to Extraction Procedures. Edward A. Cheney.

2:45 Why and How We Have Jaws, Teeth, and Face of the Broadly Human Type. Professor William K. Gregory.

4:00 Business Session.

7:00 President's reception, banquet, and entertainment.

Thursday, May 11

9:15 Prize-winning Essay. (Title and speaker later.)

10:00 Professional Ethics. W. R. Alstadt.

10:30 A Clarification of Fundamentals Pertinent to the Tweed Concepts. F. Copeland Shelden.

11:15 The Periodontal Response to Various Tooth Movements. Robert E. Moyers.

1:00, 2:00, and 3:00 Registered Educational Clinics:

1. Principles and Appliances. John M. Jackson.
2. The Prosthetic Correction of Oral Abnormalities and Deficiencies. Henry Glupker.
3. The Management of Stainless Steel. Archie B. Brusse.
4. Precious Metal Removable Appliances. George B. Crozat and Samuel D. Gore.
5. Demonstration Showing Technique of Treatment According to the Tweed Philosophy, With Final Results. F. Copeland Shelden and Associates.

4:00 Final Business Session.

Note: There will be a large number of interesting clinics on Tuesday afternoon. There may be additions to the program.
Please make your hotel reservations without delay.

American Board of Orthodontics

The 1950 meeting of the American Board of Orthodontics will be held at the Edgewater Beach Hotel, Chicago, Illinois, May 4, 5, 6, and 7. Orthodontists who may desire to be certified by the Board may obtain application blanks from the Secretary, Dr. Stephen C. Hopkins, 1726 Eye Street, N. W., Washington 6, D. C. Applications must be completed not later than March 1, 1950, for consideration at the Chicago meeting.

Research Section Meeting of the American Association of Orthodontists

In accordance with the policy of recent years, time will be set aside for research reports at the coming meeting of the American Association of Orthodontists. Any individual desiring to report on a current research problem, completed or in progress, may do so by communicating with Dr. J. A. Salzmann, 654 Madison Avenue, New York, New York.

Each application should be accompanied by the author's name, address, and institution with which he works, if any. An abstract of not more than three hundred words should be forwarded at the same time.

Presentation time will be limited to fifteen minutes.

ALLAN G. BRODIE, Chairman.

Prize Essay Contest, American Association of Orthodontists

Eligibility.—Any member of the American Association of Orthodontists; any person affiliated with a recognized institution in the field of dentistry as a teacher, researcher, undergraduate, or graduate student shall be eligible to enter the competition.

Character of Essay.—Each essay submitted must represent an original investigation and contain some new significant material of value to the art or science of orthodontics.

Prize.—A cash prize of $500 is offered for the essay judged to be the winner. The committee, however, reserves the right to omit the award if in its judgment none of the entries is considered to be worthy. Honorable mention will be awarded to those authors taking second and third places. The first three papers will become the property of the American Association of Orthodontists and will be published. All other essays will be returned.

Specifications.—All essays must be typewritten on 8½ by 11 inch white paper, double-spaced, with 1 inch margins, and composed in good English. Three copies of each paper complete with illustrations, bibliography, tables, and charts must be submitted. The name and address of the author must not appear in the essay. For purposes of identification, the author's name together with a brief biographical sketch which sets forth his or her dental and/or orthodontic training, present activity, and status (practitioner, teacher, student, research worker) should be typed on a separate sheet of paper and enclosed in a sealed envelope. The envelope should carry the title of the essay.

Presentation.—The author of the winning essay will be invited to present it at the meeting of the American Association of Orthodontists to be held in Chicago, Illinois, May 8 to May 11, 1950.

Final Submission Date.—No essay will be considered for this competition unless received in triplicate by the chairman of the research committee on or before March 15, 1950.

ALLAN G. BRODIE, CHAIRMAN RESEARCH COMMITTEE,
AMERICAN ASSOCIATION OF ORTHODONTISTS,
30 NORTH MICHIGAN AVENUE, CHICAGO 2, ILLINOIS.

Northeastern Society of Orthodontists

The annual meeting of the Northeastern Society of Orthodontists will be held at the Copley-Plaza Hotel, Boston, Massachusetts, on March 6 and 7, 1950; its fall meeting will be held at the Shoreham Hotel, Washington, D. C., Nov. 6 and 7, 1950.

Thomas P. Hinman Mid-Winter Clinic

The Thirty-seventh Annual Meeting of the Thomas P. Hinman Mid-Winter Clinic will be held at the Municipal Auditorium, Atlanta, Georgia, March 19, 20, 21, and 22, 1950. The general chairman is Dr. Sidney L. Davis, 932 Candler Building, Atlanta, Georgia, exhibit chairman, Dr. J. A. Broach, 1105 Doctors Building, Atlanta, Georgia.

Southwestern Society of Orthodontists

The Twenty-Ninth Annual Meeting of the Southwestern Society of Orthodontists was held Sunday, Monday, Tuesday, and Wednesday, Feb. 12, 13, 14, and 15, 1950, at the Shamrock Hotel, Houston, Texas.

The program was as follows:

Orthodontics in State Medicine. Frederick C. Elliott, Houston, Texas.

Case Report, Class 2, Division 1. J. P. Serafino, Beaumont, Texas.

Case Report. J. D. Larkin, Houston, Texas.

Variation in Facial Pattern and a Method of Appraisal. Wm. B. Downs, Aurora, Illinois.

Case Report. T. M. Williams, Dallas, Texas.

The Use of Cephalometry, etc. Wm. B. Downs, Aurora, Illinois.

American Living Standards. Mr. M. E. Truitt, Houston, Texas.

A New Approach in the Analysis of Malocclusion. H. J. Kloean.

Dan C. Peavy, D.D.S., Chairman

One hundred treated cases, using the Charles Tweed Method.

(Treated cases shown by members of the Charles Tweed Study Group of the Southwest.)

An adjunct in the Johnson Technique. Emily T. Hicks, Pampa, Texas.

(Esthetically speaking, an interesting combination in treating Class III cases.)

Atypical Problems and Atypical Answers. Harry H. Sorrels, Oklahoma City, Oklahoma.

(Believing the typical problems of orthodontics are generally well covered, I present a few atypical cases.)

Analysis and Treatment of Several Cases. D. P. Comegys, Shreveport, Louisiana.

(A few treated cases that might prove interesting.)

Twenty-Minute Acrylic Retainers. Drs. Rowland and Halet, San Antonio, Texas.

(New method, using flasks and quick-setting acrylic.)

Progress Slides of Cases Treated With the Twin Arch. Drs. Pugh and Benton, Wichita, Kansas.

(Leica photography slides showing progress of treatment. Illustrated, with Koda-slide Table Viewer.)

Palliative Orthodontics. William N. Flesher, Oklahoma City, Oklahoma.

(A partial denture for the correction of an anterior cross-bite showing retention with no metal clasps. Shield made of Plexiglas instead of guttapercha or vulcanite.

Aids in Keeping Appointments. T. M. Robertson, Coffeyville, Kansas.

(Definite card appointments to each patient. Use of addressed reply post card in correspondence.)

Occasional Mandibular Inclined Plane for Young Class III Cases. T. M. Robertson, Coffeyville, Kansas.

(Use of acrylic with thin fabricated metal incline plane on occlusal of mandibular anterior teeth.)

Central Section of the American Association of Orthodontists

The 1950 meeting of the Central Section of the American Association of Orthodontists will be held at Cedar Rapids, Iowa, September 10, 11, and 12.

Italian Convention on Stomatology

The twenty-fifth annual Italian Convention on Stomatology promoted by the A.M.D.I. (Italian Medico-Dental Association), affiliated society to the F.D.I., will be held from Sept. 26 to 30, 1950, at Stresa (Lake Maggiore).

Labiolingual Postgraduate Course

The third annual two-week postgraduate course in labiolingual technique was held at Washington University School of Dentistry, Jan. 16 to 27, 1950.

The course on labiolingual technique and guide plane use and construction was under the direction of Dr. Oren A. Oliver of Nashville, Tennessee. He was assisted by Dr. Boyd W. Tarpley, of Birmingham, Alabama, Dr. Harold K. Terry, of Miami, Florida, and Dr. William H. Oliver, of Nashville, Tennessee.

One of the outstanding features of the course was the release for the first time of the new comprehensive and professional quality colored pictures of the labiolingual technique and guide plane.

Augmenting the lectures, movies, and laboratory procedures, the following lectures were presented by staff members of Washington University Schools of Dentistry and Medicine:

Embryology (Anatomy of Head and Neck)	Dr. Leroy R. Boling
Behavior Problems	Dr. W. Warson
Habits	Dr. W. Brandhorst
Radiodontics	Dr. C. O. Simpson
Endocrinology	Dr. E. Carson
Growth and Development	Dr. William Klingberg
Genetics	Dr. W. Stalker
Dental Materials	Dr. E. E. Shepard
Nose and Throat	Dr. T. Klaff
Cleft Palate Problems	Dr. J. B. Brown
Temporomandibular Syndromes	Dr. J. Costen
Preventive Orthodontics	Dr. Ruth Martin
Oral Pathology	Dr. M. Burstone
Postsurgical Rehabilitation	Dr. L. W. O'Brien
Speech Therapy	Dr. M. McGinnis

American Association for Cleft Palate Rehabilitation

The American Association for Cleft Palate Rehabilitation will convene for its annual business and professional meeting on Friday and Saturday, April 28 and 29, in Chicago, Illinois. The Professional Colleges of the University of Illinois and Northwestern University are co-hosts to the Association. The convention hotel will be the LaSalle, located at 10 North LaSalle Street in Chicago. The professional meetings will be held on the campuses of the host universities. The program will consist of technical and professional papers and discussions in which the following will be emphasized:

The clinical management of the young cleft palate child.

Local, state, and national cleft palate programs and their relation to public and private health and social agencies.

The basic sciences of embryology, genetics, anatomy, physiology, and physiological phonetics.

The subjects of dentistry, speech, plastic surgery, otorhinolaryngology, and the psychosocial sciences.

Hotel and program information may be obtained by writing to Dr. Herbert Koepp Baker, Program Chairman, at the Speech and Hearing Clinic, 904 West Adams Street, Chicago 7, Illinois.

Anyone interested in any area of the field of rehabilitation of the cleft palate person is invited to attend. The convention fee is three dollars for persons who are not members of the American Association for Cleft Palate Rehabilitation. Students in all branches will be admitted without payment of the registration fee upon presentation of their university or college matriculation cards or acceptable certification.

National Children's Dental Health Day

Following is the complete text of the proclamation signed today by President Truman, proclaiming Monday, Feb. 6, as National Children's Dental Health Day:

National Children's Dental Health Day, 1950, by the President of the United States of America, a Proclamation

WHEREAS: The health of our children is of supreme importance to the future of the nation; and

WHEREAS: The prevention and early treatment of the dental diseases can be a potent factor in the promotion of the general health of our young people; and

WHEREAS: The joint resolution of Congress approved on February 1, 1950, provides as follows:

"That the President of the United States is hereby authorized to issue a proclamation setting aside February 6, 1950, as National Children's Dental Health Day and to invite all agencies and organizations interested in child welfare to unite upon that day in the observance of such exercises as will call to the attention of the people of the United States the fundamental necessity of a continuous program for the protection and development of the dental health of the nation's children";

NOW, THEREFORE, I, Harry S. Truman, President of the United States of America, do hereby designate Monday, February 6, 1950, as National Children's Dental Health Day; I also direct the appropriate agencies of the federal government and invite the state and local governments and organizations interested in child welfare to cooperate in programs designed to focus public attention upon the vital importance of preserving and improving the dental health of our children.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the United States of America to be affixed.

DONE at the City of Washington this first day of February in the year of our Lord Nineteen Hundred and Fifty and of the Independence of the United States of America the One Hundred and Seventy Fourth.

(Signed) HARRY S. TRUMAN.

Army Civilian Intern Program

Selection of senior medical students for the Army's civilian intern program is proceeding at an accelerated rate since the first of this year, Major General R. W. Bliss, the Army Surgeon General, said this week.

To date, 52 applicants have been selected. They represent 34 of the country's approved medical schools and will intern in 48 different civilian hospitals.

The first group of applications was processed on December 13. Since that date the Surgeon General's Selection Board has convened five more times in an effort to keep up with the increasing number of applications being received. It will continue to meet at frequent intervals until it has selected the 300 candidates for whom the program provides spaces.

To be eligible, a candidate must be a potential graduate who will begin an internship between Jan. 1 and Dec. 31, 1950, and must have been accepted for internship training in a civilian hospital acceptable to the Surgeon General.

Successful candidates will be commissioned in the Army Medical Corps Reserve and permitted to complete their internships as officers on active duty with pay and certain allowances of the grade of first lieutenant.

Physicians selected for this training program will serve two years on a duty status for the year or major portion of a year of formal training received.

202 Applicants Appointed in Army Senior Dental Student Program

A total of 202 selected dental students have been appointed second lieutenants in the Medical Service Corps Reserve and placed on active duty in 36 dental schools under the Army Senior Dental Student Program, it was announced this week by Major General Thomas L. Smith, Chief, Dental Division, Office of the Army Surgeon General.

This year the Army Medical Department was authorized to tender commissions as second lieutenants in the Medical Service Corps Reserve to 300 selected dental students who are matriculated in dental schools approved by the Department of the Army. Under the program, these students are permitted to continue their studies in their respective schools as officers on active duty with full pay and allowances until they complete the academic requirements for the degree of Doctor of Dental Surgery or Doctor of Dental Medicine.

Upon completion of their dental education these officers will be appointed as first lieutenants in the Dental Corps Reserve, and serve on active duty at an Army installation for two years.

Plan to Protect Birth Records

Details of a plan to protect birth records were released today by Federal Security Administrator Oscar R. Ewing in a Children's Bureau publication, *The Confidential Nature of Birth Records.*

The plan was worked out by the American Association of Registration Executives and the Council on Vital Records and Vital Statistics, and is endorsed by the Children's Bureau and the National Office of Vital Statistics, of the Federal Security Agency.

"This plan respects the individual's rights to privacy," said Katharine F. Lenroot and Dr. Halbert L. Dunn, heads of the sponsoring bureaus. "Furthermore, it offers a new convenience to everyone, in the birth card which is recommended for most certification purposes."

The plan has received official endorsements of the American Medical Association and the American Public Health Association. Some State registration systems already plan to adopt the features of the proposal.

Designed to protect the legitimate privacy of all citizens, the recommended new practices will be of special benefit to children who are born out of wedlock, who are adopted, or whose parents happened to be in an institution at the time of their child's birth.

Under the proposed policy, only the person registered, his parents, accredited health and welfare agencies, or individuals authorized by court order would have access to data on the birth certificate customarily filed by doctors and other attendants at birth.

No birth certificate would be filed until it had been seen and okayed by either the mother or the father.

Everybody would have the right to have a birth card showing only name, sex, date and place of birth, and registration date.

"These are the important improvements in birth registration procedure that are proposed in the plan," Dr. Dunn and Miss Lenroot stated today. "To put these improvements into effect, new legislation will be required in some States. In others, all that is needed is a change in present regulations.

"Registrars throughout the country are constantly trying to improve birth registration procedures. They can be successful only to the extent that they have public support and funds available. We invite all citizens to study the new proposals."

Miss Lenroot and Dr. Dunn called attention to the fact that although birth records in some States are open to almost anyone curious for information about individuals, medical, financial, and social security records have always been considered confidential.

Under the recommended procedure, there would be a uniform birth certificate that would contain all the essential information about the newborn baby and his parents. It would be filled in by the doctor or other individual attending the birth. This form would be reviewed

by the parents for completeness and accuracy before the certificate is filed. So approved, the certificate would be kept confidential in the files of the registrar, and a photostatic copy would be made available only on request of the individual, his parents, guardian, or legal representatives, or on court order. Data from the certificate would be used primarily for general statistical purposes and for providing necessary health and welfare services. When a child is adopted, a new birth certificate would be made out, and it would show the essential facts about the adopting parents and the new name of the child. The original certificate would then be sealed.

The proposed streamlined birth cards would make unnecessary in most instances the complicated business, so common today, of obtaining certified copies of birth certificates. Furthermore, these cards would protect individuals against possible embarrassment from having to reveal details which are no concern of other people, such as the fact that they were born out of wedlock, or that one of their parents happened to be in a mental institution at the time their child was born.

The following States, Territories, and cities have already instituted the use of birth cards: California, Connecticut, Florida, Georgia, Mississippi, Nebraska, Nevada, New Hampshire, North Carolina, Ohio, Oregon, South Carolina, Tennessee, Washington, Hawaii, Puerto Rico, Denver, Houston. In addition, Illinois, Iowa, Kansas, Louisiana, South Dakota, Texas, and Alaska will start using birth cards during this year. These States have also adopted the standard birth certificate and have already taken steps to keep their records confidential.

"Every citizen who has a regard for the rights of individuals and the values of public service in behalf of individuals will want to find out what birth registration problems are in his own State, through Councils of Social Agencies, State departments of welfare, and particularly State Registrars of Vital Statistics in State Health Departments," Miss Lenroot and Dr. Dunn stated.

Notes of Interest

Dr. H. Allen Bimston announces the removal of his office from 1882 Grand Concourse, New York 57, New York, to 1884 Monroe Avenue, corner Grand Concourse and Tremont Avenue, New York 57, New York, practice limited to orthodontics.

Mort Henkin, D.D.S., announces the removal of his offices to 662 Orpheum Electric Building, 520 Pierce Street, Sioux City, Iowa, practice limited to orthodontics.

Joseph K. Tucker, D.D.S., announces the opening of his office for the exclusive practice of orthodontics at 1 Hanson Place, Williamsburg Bank Building, Suite 1308, Brooklyn 17, New York, phone, STerling 9-5192.

G. C. Turner, D.D.S., announces the association of James E. Makins, D.D.S., at 406 Myric Building, Lubbock, Texas, practice limited to orthodontics.

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